

ITEMS OF INTEREST.

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Shots from the Profession.

"DENTAL CHEMISTRY."

(A CRITICISM.)

DR. E. J. LILLY, CIRCLEVILLE, O.

While looking over the interesting pages of the December ITEMS OF INTEREST the article entitled "Dental Chemistry" arrested our attention. The author, rather patronizingly it seems to us, deplores the fact that some of his readers "cannot comprehend the constituents of the compounds given," and then proceeds to lead them into worse confusion by giving to his compounds a composition they do not possess. Strict accuracy, in even the most elementary teaching, is a virtue much to be commended, but in scientific matters it is the *sine qua non* to a clear understanding. Yet some of the statements in the article mentioned are so loose and so glaringly inaccurate that those who are young in the study of chemistry are liable to be misled by them. This is our principal reason for entering into polemics with such a well known dentist and writer as Dr. Palmer.

Leaving out of consideration the fact that the doctor's calcium phosphate and carbonate and his sodium and magnesium phosphate contain no oxygen, and the statement that "alcohol and lime give chloroform * * * wholly unlike its constituents,"⁽¹⁾ let us confine our attention to what follows.

On page 549 the doctor says: "Nitrogen and oxygen, when combined in equal proportions give nitrous oxide." If the doctor will take the time to make some of the gas which he claims is nitrous oxide (but which in reality is nitric oxide⁽²⁾), and will test the result by

⁽¹⁾ Chloroform, C H Cl_3 , is usually prepared by the action of bleaching powder on ethylic alcohol and other carbon compounds; but it does not contain "lime" as one of "its constituents." Its molecule, as shown above, consists of one atom each of carbon and hydrogen, with three of chlorine.

⁽²⁾ $6 \text{ K NO}_2 + 3 \text{ H}_2 \text{ SO}_4 = 3 \text{ K}_2 \text{ SO}_4 + 2 \text{ HNO}_3 + 2 \text{ H}_2 \text{ O} + 4 \text{ NO}$
Potassium Sulphuric Potassium Nitric Water. Nitric
nitrite. acid. sulphate. acid. oxide.

inhaling some of it, probably he will not be so positive in his opinion that it is "laughing" gas.

All dentists know, without going into detail, that nitrous oxide, N_2O , is prepared by decomposing by means of heat the salt called ammonium nitrate, NH_4NO_3 , and collecting the resultant gas. On writing out the reaction :— $NH_4NO_3 + \text{heat} = N_2O + 2 H_2O$.,

Ammonium nitrate.

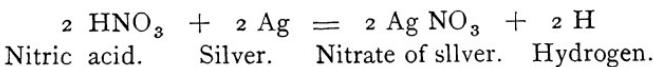
Nitrous oxide.

Water.

we find, if the equation balances, that nitrous oxide is *not* "nitrogen and oxygen * * * in equal proportions," but that it is composed of two proportions of nitrogen with one of oxygen—a very material difference when we consider the deadliness of the one and the pleasing effect of the other when inhaled.

Again. On the same page the doctor uses these words: "One part nitrogen and five of oxygen give nitric acid." When will the old and erroneous system of notation give place to the new? We have so often seen in dental and other periodicals that nitric acid is composed of nitrogen and oxygen; sulphuric acid of sulphur and oxygen; carbonic acid of carbon and oxygen; hypochlorous acid of chlorine and oxygen, etc., etc., that it is about time, for the sake of those at least who are just beginning the study of chemistry, to enter a protest. Granted that these elements do enter into the composition of acids, giving to them certain characteristics, yet they no more make complete acids than pure oxygen makes complete water.

An acid is defined as "a salt of hydrogen" (this element *always* entering into its composition), and consists of an acid radical⁽³⁾ united with hydrogen, which latter may be displaced by a metal, so forming a salt of that metal. The following equation shows such a change :—



the reaction is similar in the formation of any salt from an acid and metal—the hydrogen of the acid gives place to the base, with the formation of a new salt.

Each molecule of every acid contains one or more atoms of displaceable hydrogen, the number depending on the combining power of the radical. For example, the molecule of nitric acid contains one atom of hydrogen united with the monad radical NO_3 , making HNO_3 ; that of sulphuric acid contains two hydrogen atoms combined with the dyad radical SO_4 , the completed formula being H_2SO_4 ; other acids are of like construction. We find then that nitric acid (hydric nitrate) does *not* consist of "one part nitrogen and five of oxygen"—there is

(3) A radical is a group of atoms, or a single atom, which preserves its integrity while transferred from one molecule to another, being a leading constituent of each. (Prescott.) See also Note 4.

no such compound in chemistry. The formula for the nitric acid molecule, as we have seen, is HNO_3 —one atom each of hydrogen and nitrogen, and three of oxygen. Sulphuric acid is *not* “one part sulphur and three of oxygen”—that is the anhydride⁽⁴⁾ of the acid—but is written H_2SO_4 . Hypochlorous acid is *not* composed of “one equivalent each of chlorine and oxygen,”⁽⁵⁾—chemistry does not furnish such a compound. The one nearest to it is hypochlorous anhydride, Cl_2O , which, on the addition of a molecule of water, will make the acid:—



Hypochlorous anhydride. Water. Hypochlorous acid.

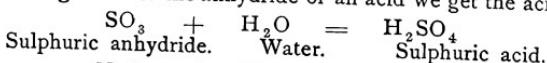
Carbonic acid is *not*—but to continue the list would take more time and space than we have at our disposal.

Only a word more, as this paper is now much longer than intended. To unlearn that which has already been acquired is often a much harder task than to learn something new and strange. Yet it seems to us this makes but a poor excuse for teachers to cling to and continue to promulgate that which has been shown to be incorrect. We as students desire the newest and best in all we are taught, and, failing to receive it, think it but just to enter a remonstrance.

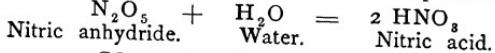
Moderate drinkers engaged in pursuits calling for judgment and acumen end, with scarcely an exception, as financial wrecks, however successful they may be in withstanding the physical consequences of their indulgence. Thousands who retain their health and are never ranked as victims of intemperance lose their property, wreck their business, and are thrown into bankruptcy because of tippling habits. These men are not drunkards, and only close observers can detect the influence of strong drink in their deportment; but nevertheless liquor gives them false nerve, makes them reckless, clouds the judgment, and soon involves them in bad purchases, worse sales, and ruinous contracts. Sooner or later it is shown that the habit of tippling is a forerunner of bankruptcy. The professions are not exceptions.—*Chicago Tribune*.

⁽⁴⁾ The anhydride of an acid is what remains after removing from its radical (See Note 3) enough oxygen to form water with its basic hydrogen (Prescott). Thus the formula for sulphuric acid is H_2SO_4 ; taking away the hydrogen leaves the dyad radical SO_4 ; taking from the radical an atom of oxygen to form water with the removed hydrogen, leaves the anhydride of the acid SO_3 .

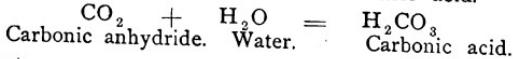
Now, by adding water to the anhydride of an acid we get the acid itself:—



Sulphuric anhydride. Water. Sulphuric acid.



Nitric anhydride. Water. Nitric acid.



Carbonic anhydride. Water. Carbonic acid.

⁽⁵⁾ *Vide* “Labarraque’s Solution” in December ITEMS, page 558.

PORCELAIN AND PORCELAIN TEETH.

J. F. FRANTZ, M.D., WILMINGTON, DEL.

Porcelain is simply a translucent pottery. Pottery has a history dating as far back in the ages as there is knowledge of the existence of man. Every people in all ages have known the use of pottery. The art of making it, in forms useful or artistic, from the plainest molded brick to the richest decorative ware unearthed from tombs of centuries, and gathered in museums and private collections of the present day, are interesting libraries of by-gone ages, speaking the history of the thoughts and tastes of departed man. Translations from such imperishable volumes lead the investigator step by step from the unglazed pottery of Mesopotamia to the highly finished and artistic productions of the Egyptians; and to the art of painting or enameling. Ninevah and Babylon in later years applied it in magnificent grandeur to the rearing of their temples in enameled brick.

The Phenicians discovered a thin varnish imparting to their wares a rich luster. They transmitted their secret to the Greeks, who used it liberally in their decorations.

This method of making pottery descended to the Romans, and flourished for an indefinite period. But with the decline of the Roman Empire disappeared also all traces of this class of Ceramic art, till it was entirely lost to Europe. Modern ages witnessed another discovery or revival of the art through the Saracens, who produced some magnificent effects in their painting and glazing and they imparted to the Christians both the art and the enthusiasm for its development.

Interesting links in the chain of the history of the Ceramic art are lost, but enough has been unearthed to establish the conclusion that the course of transmission was from Syria to Persia, and thence to China, China to Corea and Japan. It remained a product of Central Asia, till the Mohamedan conquest. Then it was appropriated by the Arabs and carried by the limited channels of communication of the middle ages to wherever they extended their ramblings. It is recognized in Germany from the twelfth to the fourteenth centuries. An Italian sculptor in the fifteenth century attained notoriety by his productions in the art, and he gave his knowledge to his countrymen, who conveyed it to the French and thus it was distributed through northern Europe.

Translucent pottery, or what is known as Porcelain, originated in China or Persia over two thousand years ago, and for sixteen hundred years it remained a profound secret with these people. About the year fifteen hundred, an aged potter in Venice by some means acquired a knowledge of the mysteries of Porcelain making and produced it in

some quantity; but with his death was lost his secret, and it lay buried in Europe for another generation.

In 1580 Porcelain was produced in Florence, but only in an experimental way and again it was lost, till a potter in England claims the discovery of the secret in 1671, no specimens of his work, however remains.

Its manufacture on a permanent and commercial scale was only commenced in 1695, when at St. Cloud in France was started a manufactory of translucent pottery or what was known as Soft Paste Porcelain. In 1710 the mysterious secret of Asia was revealed to an inhabitant of Dresden, Germany, where it has been extensively made ever since. Probably few can be found who are not familiar with the name of Dresden China, as stamped on the under side of their table ware in daily use. The United States is now a strong rival and produces some of the finest porcelain in the world.

Porcelain was first adapted to the use of dentistry in France about the year 1776. The following is related as the responsible cause: An apothecary; named Duchateau, of St. Germain, being unfortunate enough to lose his natural grinders, had them substituted by a set of ivory as carved at that day. His business confining him to an atmosphere impregnated with various disagreeable odors, the ivory absorbed these effluvia, and became a source of serious annoyance. This led to investigations for the discovery of some substitute free from this objection. He at length determined on porcelain, and sought the services of M. Guerard to manufacture a set. The success was so encouraging that others sought similar relief, so that soon there was established the manufacture of artificial teeth from this beautiful substance. In 1778 a French practitioner named Dubois de Chamont purchased the secret of compounding from Duchateau, and secured a patent for the discovery both in his own country and in England. He encountered considerable opposition, and his claims to superiority for these over those in use were severely contested.

Dr. A. A. Planton, who arrived in the United States about the year 1817, is credited with the manufacture of the first mineral teeth in America, Dr. Villers, of Boston, contesting with him the claim to priority. Charles W. Peale, of Philadelphia, being the next in line to receive the honors attendant on the introduction of an industry that has developed to mammoth proportions in less than half a century.

These early productions of artificial teeth were crude and unshapely. They were secured to the plate with rivets, as were the animal and other teeth in use up to that day.

Following the successful efforts of these few pioneers, prosthetic dentistry commenced to attract the attention of many able men in all

parts of the country. Dentistry became an established, independent, and honorable profession of rapid and continuous growth, keeping far in advance of its progress in all other countries.

For many years dentists mixed materials, and carved and burnt the teeth in their own laboratories. This required much skill, great care and attention, and an intimate knowledge of porcelain, and at best was costly, laborious, vexatious and often unsatisfactory.

As soon, therefore, as there was established a manufactory for the production of good teeth in quantity, there was little difficulty experienced in securing patronage.

Samuel W. Stockton, of Philadelphia, in 1825, was the first in the United States to commence their manufacture for the trade, and he soon received liberal patronage. Many others ventured, though few succeeded.

One of the most serious difficulties experienced in the production of a tooth to closely imitate nature, was the securing of a true gum color, which was not overcome till Dr. Elias Wildman, of Philadelphia, reduced the manufacture of porcelain teeth to a scientific basis. He commenced his experiments in 1837, and succeeded in producing a formula which accomplished the desired results, and is still the basis for all gum enamels.

Having passed in hasty review the history of the art of dentistry as well as that of ceramic art from early days to the discovery of that particular form of porcelain to which artificial teeth belong, we will now illustrate the details of manufacturing an artificial tooth by describing the process as conducted by The Wilmington Dental Manufacturing Company in their extensive factory at Wilmington, Del.

Their factory consists of a large four-story main building, and one of three-story in the rear, connected by the furnace building, which surrounds the tall stack, securing the powerful draft to the furnaces ranged round it. Commencing on the ground floor of the rear building we will trace the formation of these teeth from the crude material till we see them in the store-room, where they appear mounted on the wax cards, ready for market. In the first room we find stored the raw materials entering into the composition of the tooth structure. These are feldspar, kaolin and silex. All of these minerals are found in liberal quantity in the neighborhood of Wilmington. In the adjoining room are many workmen engaged in carefully selecting and crushing these raw materials and preparing them for reduction to a fine powder by large mills driven by a gas engine on the floor above. When thoroughly ground it is taken to the drying-room, where it is evenly distributed over boards, and when perfectly dry is sifted and ready for use in the mixing-room. Here are conducted, by the chemist, the

most important and delicate manipulations of the entire business. Here is produced the "body" and the delicate "gloss," and the necessary coloring matter which gives the beautiful shading required in imitation of nature's great variety. Gold, chemically prepared, produces a red or pinkish hue; titanium a yellowish tinge; platinum a bluish color. Manganese, uranium, nickel and other mineral colors are skilfully manipulated to make an infinite variety of shades, constituting one of the vital elements of artificial tooth-making. Proficiency in this branch of the art can only be attained by years of earnest study and experimental effort in the laboratory.

The "batches," when properly prepared, are taken to the molding department, which occupies the third floor of the main building, where, seated at benches ranged round all sides of the room, are the employees dexterously manipulating with the small instruments, molding into shape the material which in successive processes results in a well-shaped, natural-looking tooth. The materials are prepared in the laboratory for the molders' use in three batches, one forming the body, or main portion of the tooth; another the enamel, or biting edge and covering, and the third the gum and tooth color. The gum coloring is not required in plain teeth. These several batches are prepared on a large marble slab by reduction from the powdered form in which they come to this room to the consistency of putty, and in this shape are distributed to the several members constituting "a molders' gang." Each does his allotted part in molding into proper shape and position the portion assigned him. This body is passed into brass molds, which are made in two parts, one half the tooth being represented in each side. Platinum pins are inserted in each tooth just before the molding process. The platinum is a very costly metal, imported from Europe, the Ural Mountains being the principal source of natural supply thus far discovered.

The molding being carefully completed, the molds are tightly closed and placed under a press where all surplus material is expelled. They are then conveyed to the gas machines, where over a Bunson burner all moisture is expelled from the tooth material, when a few taps from a mallet causes the teeth to drop out. They are now in condition to be handled and trimmed for baking. In the trimming department a number of operatives with delicate files and saws separate the teeth and trim off all the superfluous material. The teeth are then carefully placed on clay slides, covered with a layer of broken silex, and conveyed to the furnace building, where in muffle ovens the teeth are baked at a white heat, developing the colors and giving polish to them. The practiced eye of the man in charge determines by their appearance when the teeth have the requisite heat. Removed now to

annealing ovens, the teeth remain from twelve to twenty-four hours. They are then conveyed to the carding-room, where the operatives dexterously select the good from those in any way defective, see that the good are well matched, and then place them neatly on wax cards, ready for the salesroom and market.

TREATING TEETH.

DR. GEO. MILLS, NEW YORK.

It is a rainy Saturday, 12 o'clock, noon. Two patients have filled the morning hours. Saturday afternoons in New York are being so generally taken up by matinees, few appointments are made, which leaves a half holiday for the dentist. This is no detriment to the faithful practitioner.

My first patient to-day is about sixty, of a refined temperament, teacher, has as beautiful a set of teeth as is often seen—minus six that are gone; little filling has ever been needed in his teeth. Of late quite a tendency to waste of the soft and hard tissues has developed. What we call decay, is beginning to manifest itself beyond the enamel border. On the anterior proximal surface of a lower molar, I find out of sight a large cavity, extending across the tooth at this point. It is filled with hypertrophied gum, no pulp exposure. I pack this cavity with a pledget of cotton moistened with caustic soda and carbolic acid (crystal) mixture, half and half; then formed a provisional compress of red gutta-percha molded into the space and chilled with ice, to remain till a future sitting. The caustic will destroy the tissue in the cavity. The compress will prove a valuable auxiliary for confining the dressing, until the cavity is prepared, gutta-percha is without a doubt the best filling to be used, all things considered. On a corresponding tooth above I find a crown cavity, formerly filled, the cavity now extending up on the proximal side of the root. To this, I apply the clamp and dam; after sterilizing I remove all soft debris and trim the margins. I then fill the cavity in the root portion with Robinson's felt, burnishing it in à la Herbst; while the cavity that extends on the crown nearly to the grinding surface, I fill with monogram cement temporarily.

The second patient an adult, a week ago I opened a pulpless molar which occludes a little on the proximal grinding surfaces of two teeth below. This tooth had a fistulous opening over the buccal roots. The color of the tooth was of a greenish tinge; it having a large filling on the posterior proximal surface. I drilled directly through the grinding surface to the pulp chamber, then enlarged the opening enough for access to the pulp channels; from this opening came a sickish odor; after thoroughly sterilizing the cavity, I enlarged the palatine canal with a flexible reamer in the engine—dipped in creosote—which readily passed through the apex I opened, cleaned the tooth

with a swab made of cotton and the caustic remedy (spoken of before) with a pledget of absorbent cotton, I wipe out the excess of the caustic mixture; then forcing aromatic sulphuric acid into the opening and extending it through the pulp canals, as much as possible into the diseased territory about the roots of the tooth. I allow that to be absorbed, while continuing my preparations for the finishing of my operation. For medicating and filling the pulp canals, I whittle an orange wood stick nearly to conform to their size, dip this in oil of cloves and creosote, half and half, adding a little iodoform. Tap it in with the mallet. I fill the remainder of the cavity with monogram cement.

This operation was made a week ago to-day. The tooth and its surroundings have assumed an entire change in the direction of health, and bids fair for a useful career in comfort and cleanliness. This treatment has produced only proper sanitary conditions and thus cut off the support of the disorder. To those who read this and doubt—go and do likewise to many such teeth that come into daily observation and thus extend a simple and useful practice. If you have a case without a fistulous opening, pursue the same practice and ninety-nine times out of a hundred you will have the same results. If you have a doubt as to future pain, *prick* it, that is, through the gum and alveolar process in the line of the apical territory and you are sure to succeed. Do not dispute this, but do it.

The following is the formula of the sterilizing fluid: Bi-chloride of mercury, 1 grain to the ounce of distilled water.

A sensible and successful missionary.—Wm. Taylor of the M. E. Church, is the most successful missionary of modern times. Wherever he goes,—and during the last twenty years he has planted extensive colonies in South America, Australia and India,—his efforts are unique in two respects: all his missions are self-supporting and accompanied with all the paraphanalia of civilization. The great effort of his life is now being carried out in central Africa. At 50 or 100 miles apart he is planting stations right through the continent from west to east in two parallel lines. At each station he has not only his mission chapel and religious services but his model farm, and his Christian tradesmen, mechanics, and professional men. Even a technical school is established where the natives are not only taught the rudimental and theoretical branches of a common education, but are skilled in the use of tools, and educated to be tradesmen and artisans. Who will say his efforts to Christianize these heathen are not advanced by thus bringing to them civilization also.

LABORATORY INQUIRIES ANSWERED.

DR. L. P. HASKELL, CHICAGO.

1. *Will common Babbitt metal make good dies?* No, because it is too soft; lead being used instead of tin to cheapen its cost. The proper formula for dental dies is 1 part copper, 2 parts antimony, 8 parts tin, to be melted in the order named, otherwise the tin would oxidize badly. Melt in a crucible, and, as a high heat is needed, take it to a foundry or to a blacksmith's forge. This metal has *all* the requisites of a dental die.

2. *What do you use for counter-dies and how obtain them from the Babbitt metal dies?* Use lead with tin added to reduce its melting temperature as pure lead would adhere to the Babbitt die. Take 5 pounds of lead, 1 pound of tin, coat the die with whiting; insert partly in the sand, place a ring around it and pour not too hot. It is never necessary to use the ring in swaging.

3. *Do you put paper between the joints before soldering?* No need of it. The backings should not meet except at the base.

4. *What is your investment for soldering?* Plaster and sand equal parts; enclose in a sheet-iron ring an inch wide and a little larger than the case.

5. *What kind of soldering appliances do you use?* A convenient appliance for holding the case is made of sheet iron, $3\frac{1}{2}$ inches in diameter, semicircular in form, *open* on the straight side, with a rim 1 inch deep, and a 10 inch handle riveted to the bottom, at the corner, diagonal to the cup. Heat the case as hot as possible over the gas.

For heat, if gas is used, form a bulb 1 inch thick, by winding fine wire over the end of the gas pipe, using no *fixture* on the pipe, or use three or four thicknesses of fine wire gauze. Either will give a flame like a lamp, requiring no force to control it. Use a blow-pipe with large orifice for the mouth, to be *pressed against* the lips, and with a good sized opening for the blast, so the whole flame can be utilized. Such a blow-pipe is now made by the S. S. White Co., at my suggestion.

I prefer 20 carats plate, and solder of the same fineness, and never less than 18 carats. The nearer the solder to the melting point of the plate, the better it works, not rolling up but blending right with the plate. Plate should be made of pure gold with an alloy of pure copper and silver. It is not necessary for the dentist to make his solder while the White and Justi establishments furnish so fine an article.—*Ohio Journal.*

Iodo has been found to be a powerful antiseptic, having an anesthetic action and promoting the granulation of wounds. It is soluble in alcohol, chloroform, ether, and slightly in olive oil. It contains nearly ninety per cent of iodine, and is free from the disagreeable odor which characterizes iodoform.—*Weekly Medical Review.*

AMERICAN DENTAL ASSOCIATION.

(Next place of Meeting—Editorial in *Dental Eclectic*.)

The selection of Asheville, N. C., as the place for holding the next meeting of the American Dental Association, is, we think, a most happy one, and one that will give particular pleasure and satisfaction to the profession throughout the South. In selecting the place of meeting, there are so many things to consider that it is rendered no easy task to the committee, and it matters not what place may be selected there will be some dissatisfaction manifested. The place of meeting of this National organization should be central and easy of access. The time of holding the sessions (August) would seem also to indicate a cool and pleasant resort, where ample hall and hotel accommodations are to be obtained.

Asheville possesses all of these conditions, with possibly a single exception, that of centrality. But little can be urged against it however, on that point, as it is centrally located between North and South and easily accessible by rail from all points. It is reached from the North and South, by the Richmond and Danville system of Railways, and from the West and Northwest by the East Tennessee, Virginia and Georgia Railway, both systems making close connections. The surrounding country also offers delightful opportunities for excursions, if these be desired after the meeting. Roan Mountain, Mt. Mitchell, the water divide, and hosts of other interesting features well worth visiting, are in easy distance and may be reached with but little trouble. The beautiful "Land of the Sky" is known far and wide for its magnificent scenery, its lofty mountains and pastoral vales. The beauties of the French Broad River have been sung by poet and transferred to canvass by the painter, and the lofty peaks of the Alleghanies, with their prehistoric rocks, and vegetation of the Carolinas and Labrador, have been the delight of geologist, botanist and tourist. Asheville, a beautiful and thriving city of 7,000 inhabitants, is in the heart of this lovely region, and with her pure mountain air, low temperature and magnificent hotels, is in our opinion one of the choicest spots to be honored by a meeting of so eminent a body as the A. D. A. It is now none too early to work for the success of the coming meeting, and it is hoped that mistakes of the past may be avoided, the best councils prevail, and each member, forgetting all personal differences and advancements, will unite to make the future of the Association grand and eminently useful.

The time will come, and it is not distant, when our descendants will say of us, "Why were they satisfied with 'regulating' the liquor traffic?"

IMPLANTATION OF TEETH.

DR. W. J. YOUNGER, SAN FRANCISCO.

Gentlemen: By implantation I mean that operation which involves the forming of a socket in the jaw, either where one has been obliterated by time or where the part is virgin,—never having borne a tooth,—and into which socket a tooth is planted. I have chosen this term not only on account of its fitting etymology, but to distinguish it from the old and well-known operations of replantation, which is the returning of a tooth to the place in which it grew, and transplantation, which is the transferring of a tooth into a socket from which another tooth has been freshly drawn. This operation of implantation, which has roused so much antagonism, and the success of which is viewed with so much skepticism both by the practitioners of our own profession and those of medicine, has been in my hands thus far as successful as any other operation requiring skill and judgment known to our art. The objections that have been urged against implantation are not only all those that have been made against transplantation:—the chief of which is the liability of the transmission of disease,—but the additional danger due to the traumatic lesion which is involved in the operation, and a supposed tendency in consequence to inflammation, pyemia or septicemia, tetanus, etc.

Another reason for doubting the success of implantation is the popular belief that the natural socket of the alveolus has a periosteal lining, and that it was to this periosteum that attachment to the periodental membrane, and consequently the tooth, was due. This or something like this has been the teaching of our schools and text-books. I think, however, in the pamphlet issued by me last March I clearly demonstrated, by reasonable deductions, that no such membrane as a periosteum lining the socket exists or has any part in the formation of the cavity, and that the pericementum has no creative energy except on its dental aspect, its alveolar surface having simply the power of forming attachment and drawing nourishment. That it has this power is evidenced by the fact that it will attach itself to the vascular structure of a cock's comb, so well proved in that particular experiment narrated by John Hunter, where the fowl was killed after a few months, and microscopic examination showed that the blood-vessels of the cock's comb had united with those of the periodental membrane, and so had established direct and continuous vascular communication between the two heterogeneous tissues. This same experiment also proved that the pericementum has no bone-producing power on its external surface; otherwise a bony shield would also have been found surrounding the root.

In the pamphlet referred to I called attention to the well-known fact

that the crown was the first portion of the tooth formed by the dental pulp; that as it was developed it pressed on the inclosing alveolus; that this pressure caused the absorption of the osseous environment, which absorption continued till the crown burst through its bony prison, and rose, as the body and root developed, to the apical termination, and attained its proper elevation in the mouth. As the cavity of the socket was formed by pressure, it is clear to see that no periosteum was employed in its formation. The crown being larger than the body of the tooth when it passed out of the jaw, left a space between the root and the walls of the socket, which, in the course of time, filled up with a bony substance identical in composition with the surrounding structure. Here we have an example and a clear proof of the ability of the alveolus to repair an injury done to itself. When the crown is forcing its way through there is no attachment to it, because it is like so much flint or porcelain; but as the root with its peridental investment is developed, immediate attachment takes place, and the pericementum is nourished and stimulated in its growth by the vessels of the alveolus. How does the space between the wall of the socket and the body of the tooth fill up? We have shown by the experiment in the cock's comb that the pericementum does not produce bone on its external surface, and as there is no periosteal membrane lining the socket, the space must be filled from the walls of the socket. Osseous deposition takes place, then, as in other bones when the lesion is remote from the periosteum, by proliferation of bone-germs from the endosteum; which, as you all know, is the delicate continuation of the periosteum in the interstices and cells of the bony structure, and having all the functions and powers of the mother membrane.

Now, I hold that the same conditions attend the operation of implantation as occur in the development and eruption of a tooth, with this difference, that in the one case the destruction of the jawbone is subjective from within out, and in the other objective from without in. The one is physiological, the other traumatic, but it is in either case a lesion of structure produced by force, with the conditions in favor of the traumatic. For in the natural operation, as you are all aware, there is variable constitutional disturbance, even sometimes to a fatal degree; whereas, in the mechanical process the disturbance is only local, and slight at that. When the implanted tooth is in position the relations are almost identical with those surrounding the freshly erupted tooth from its bony environment. It is tooth-substance,—pericementum, plasma, and raw bony surface. In this view, it is easy to understand that the tooth implanted is not more foreign to the alveolar process than is the tooth developed within its own substance. It is, therefore, no wonder that the intruder is accepted on the same terms as the developed

tooth, especially in view of the fact that the alveolar process has no special intelligence, and is intended for no other purpose than the support and maintenance of teeth. Further proof that the jawbone accepts the new tooth on the same terms with its own, is that in the three instances where I have had to correct the position of these implanted teeth, after they had become firm, they have behaved exactly as do the teeth of native growth.

Now, as to the danger attending the operation. There is, of course, no operation, however trifling, that some hidden idiosyncrasy in the patient may not lead to dangerous results. The lancing of a gum has induced tetanus. The extraction of a tooth, even the too close snipping of a hair in the nose, has induced fatal hemorrhage, and so, in that view, there is danger to some in performing the operation of implantation. But who would hesitate to lance a gum, or extract a tooth, or to snip a troublesome hair in his nose because fatal consequences have attended these operations? So will it be with implantation! The great danger to be guarded against is the inoculation of disease. But it is no more so in implantation than in transplantation. Of the hundreds of cases of transplantation that have been performed in the United States, I have yet to hear of one where specific disease was communicated by it. One case—but that was replantation—is on record where it is said tetanus ensued. But was it tetanus or peritonitis? The danger of such transmission of disease has been very greatly exaggerated. Nevertheless we cannot be too cautious in our selection of teeth. Those only should be used where the tooth substance has a clean, clear appearance. They should then be subjected to a bath of bichloride of mercury, 1 part to 1,000 of water, as an additional security. So powerful a germicide is this corrosive sublimate, even at this decimation, that it will destroy the life of, or at least render inert, the most baneful of germs; and this without affecting the vitality of the pericementum. The wonderful tenacity of life in this membrane is something that was not dreamed of till the accidental discovery related in my report to the California Dental Association, and a copy of which many of you have seen. Another danger would be the drilling into the dental canals; but this can be easily avoided by not drilling beyond the length of the other teeth. The canal, you must remember, is always beyond the apices of the teeth, and only a bungler would broach it.

There are two things that are always essential to success in implantation, and that must be considered before the operation is undertaken. First, the root must have a fair covering of pericementum; secondly, sufficient alveolar process must be left to root the tooth properly, that it may be able to withstand the lateral and grinding movements of the jaw. At least two-thirds of the root should be covered

by the gum and the alveolar process. Where there has been but slight shrinkage of the alveolus it is not necessary to imbed as much root as the other teeth have. You have no doubt observed that, in teeth which have been elongated by disease, the disease cured and the projecting portion of the tooth cut off, the tooth has become as firm and performed its functions in mastication as thoroughly as it did before disease had attacked and shortened its length in the socket?

In the operations that I have had the honor of performing before you, especially in the implantation of the two inferior centrals, a great portion of the external wall of the alveolus had to be removed. You will find that within one month sufficient osseous deposition will have taken place in front and on the sides of those teeth to hold them firmly in position.

There was a good deal of tartar on all the teeth, and of course I removed this and treated the gums before implanting the teeth, for I wanted to get the parts in as healthy a condition as possible before the operation. After the other teeth were freed from the tartar, and the gums quite healthy, I extracted the two elongated teeth, removed the tartar from them, and found that about one-third of the root of the central was covered by pericementum. The lateral had a better chance for success than the central, as about one-half its root had the pericemental covering. Then I enlarged the pulp-canal from the apex, removed all of the pulp, and washed the interior of the canal thoroughly with a preparation of the bichloride of mercury. I then thoroughly dried it and filled with Hill's stopping, till I came within about one-sixteenth of an inch of the end, where I used the preparation of Dr. Slayton, of Florence, composed of gold and tin, equal parts. I prefer that to gold in that locality. All I had to do then was to deepen the sockets and to replant the teeth. The replanted teeth were kept in one day by means of ligatures, at the expiration of which time I took an impression of the teeth and made a strip of gold plate, struck up so as to fit the palatine aspect of the front teeth, extending from one cuspid to the other. Then I drilled two little holes in the gold on the line of each interstice and passed through them threads of fine waxed silk, and tied all the teeth,—the fixt teeth first. With the exception of treating the gums with a little iodine, I have done nothing at all since. Some days ago the lady removed the plate, and the teeth have been for several days without any support. I wanted to give them a chance to get loose, if they would, while I could still give them some care. The plate was put in on the 19th of August, and was worn about six weeks before being removed. The lady had a habit of gritting her teeth at night, and she was afraid she would loosen the teeth if the plate were removed.

Dr. William Jarvie says of these teeth: The left central and right lateral incisors

had been replanted. From what I saw of them I should say that the right lateral was as firm in the jaw as it ever had been; certainly as firm as any other tooth in the mouth. I could notice no recession of the gum whatever. Around the left central there was a slight recession of the gum, but no more than we usually see in teeth of so dense a structure and in the mouth of a person of the age of this lady. The bicuspid which had been implanted was apparently as firm as the other teeth, and the gum as healthy around it.

DOES VITAL UNION TAKE PLACE IN IMPLANTED TEETH?

[Quizzing in the Odontological Society.]

Dr. Dwinelle. May I ask Dr. Younger if he ever extracted any teeth that he had implanted to see whether any absorption had taken place?

Dr. Younger. Yes; there were two,—one a molar, quite apart from any other tooth, which it was impossible to support properly. The patient used the tooth in eating, and as it was only one-third rooted in the jaw, there was so much absorption that I found it would not be a success and removed it, with the intention of performing the operation again as soon as I could get a tooth with two long roots. The other was a left inferior molar, where the outer plate of the alveolus had been entirely destroyed by Riggs's disease, and the roots were not at all adapted to the purpose. In that tooth, as in the former, attachment had taken place; for when I extracted it there were several patches of bleeding perisoteum on the roots, showing that there had been living union.

Dr. Benj. Lord. I would like to ask Dr. Younger his reasons for opening into the pulp-chamber through the foramen rather than through the crown. Would it not be better to preserve the end of the root intact, in its natural shape and condition?

Dr. Younger. You cannot always fill directly to the end of the root from the crown, because the canal is so small; therefore, I usually enlarge the canal from the apex. I would enlarge it whether I filled from the apex or the crown. Another reason is that it leaves the crown intact.

Dr. Woodward. When did you first perform the operation of implantation?

Dr. Younger. On the 15th of June, 1885. The tooth implanted was a lateral, and after it became firm—not being satisfied with its position—I turned it in its new socket by the use of a simple regulating appliance. As a consequence a small abscess formed over it, but no one would now suspect that that tooth had not grown in that patient's mouth. The tooth was light in color when implanted, but now it is the same color as the other teeth. There is something singular about the modification of color of implanted teeth that I do not understand.

Dr. Perry. About how many teeth have you set in this way altogether?

Dr. Younger. About forty. I have had two failures, though they should not be considered as such, for I had but little hope for their success; yet I want to state something in the way of failures, that my successes may be believed in.

Dr. Geo. S. Allan. You stated that the replanted lateral incisor which we have seen to-night was coated with tartar half way up the root?

Dr. Younger. Yes.

Dr. Allan. Dr. Atkinson has said the gum had formed a close attachment to the neck of the tooth. I have always understood that tartar destroyed the pericementum. What was the nature, then, of the attachment which the doctor found there?

Dr. Younger. It was the implanted bicuspid from which Dr. Atkinson tried to lift the gum. In the replanted teeth there is nothing but a contraction of the gum around the necks. There is no real living attachment except where there is pericementum.

Dr. Lord. Will Dr. Younger tell us whether he thinks it desirable to cut off the end of the root and shape it?

Dr. Younger. Sometimes, where the root is crooked, and the tooth is too long. If I were to insert a tooth of too great length, I might possibly broach the dental canal. But I would prefer not to cut a root if it can be avoided, because the best portion of the pericementum is often around the apex of the root. The only time when I would broach the crown of a tooth to remove the pulp and filling the canal is in those cases where the pericementum is healthy around the apex of the root, and but slightly distributed elsewhere. One case which interested me much was that of an old lady who, in falling, had struck the right superior central and shattered the labial plate of the alveolar process. In the course of time the process and gum sloughed off, leaving the front and sides of the root of the tooth bare. It became elongated and hung down in the mouth, annoying her in speaking. She had a strong prejudice against wearing an artificial denture. The tooth was so loose that I removed it with my fingers. As the crowns of her teeth were very peculiar in shape and not easy to match, I cut the root off the extracted tooth and fitted its crown to another root, which was well covered with pericementum. I then made a deep incision in the gum, deepened the socket with a bur, and inserted the tooth. That tooth is now as firm as any tooth in her mouth, bone having been deposited around the root; and there is nothing in the appearance of the gum or the tooth to indicate that such an operation had been performed. The

lady says that only saints perform miracles, and as this is a miracle I must be a saint; but I am afraid she does not know me.

Dr. J. Smith Dodge, Jr. I think we are not so wholly on new ground here as some of us may suppose. After seeing the operation on Saturday, at Dr. Woodward's office, it occurred to me to look up John Hunter's account of his experience in transplanting teeth, written about one hundred years ago. He knew nothing of new sockets, nor did he even think of deepening the socket where a tooth had been partially pushed out by a new deposit of bone, as does Dr. Younger. In that case he either cut off the root and replaced his tooth, or selected another tooth with a shorter root. He merely transplanted from one mouth to another. He speaks of that operation as a usual thing in his own experience, as though he had performed it many times. He advises that a fresh tooth should be taken if possible, but says that many dentists prefer dead teeth (by which he means dry teeth), and that he himself has seen dead teeth become perfectly firm after insertion, and do service for many years. He advises the use of a fresh tooth, a little smaller than the socket, but says that, if you cannot get a fresh tooth that just fits the socket, it does no harm to file the root down till it will fit, and, that as far as he has been able to see, those teeth take hold no less effectively than teeth that are not treated in that way. This treatment, of course, removes the pericementum. And this is testimony over one hundred years ago, from a man who had done that frequently. Dr. Younger has spoken of preserving that pericementum with great care. I want to ask him whether there have been any cases in which he has not been able to preserve it, and whether fresh dentine without any pericementum will take hold just the same as if it had it?

Dr. Younger. It is probable that John Hunter filed only a portion of the root, not its entirety, and that therefore he left sufficient pericementum to make an attachment. In one case that I treated, the root was so much larger than the cavity that I shaved off two sides of the root, and then forced it into the socket; but I was careful to preserve the pericementum on the other two sides. That particular tooth is in the mouth now, as good as ever; but no attachment has taken place on the sides of the root that were shaved off. It was transplanted about an hour and a half after it was extracted, February 14, 1881,—nearly six years ago. I saw the lady three weeks before I left California to come here.

The President. What retained that tooth in place?

Dr. Younger. Attachment of the pericementum on the two surfaces that were not filed. Attachment will be formed in spots here and there where the pericementum is preserved. If half the pericementum remains on the root I would use the tooth with a reasonable hope of

success. In one instance I implanted a tooth which had no pericementum on it. I did it for two reasons: to gratify the patient, and to show the operation of implanting to Dr. Roussell, I think, the corresponding secretary of the Brooklyn Society, who was present and anxious to see it done. The lady was anxious to have a lower molar implanted. I told her there was no possibility of its taking hold, as there was no pericementum on the root, but she insisted, and I implanted it. It was put in as carefully as any tooth I ever implanted; looked well at first, and was quite firm after the operation, but in about a week it loosened and fell out. I have no confidence in the implanting of teeth that have no pericementum.

Dr. Tenison. Have you tried cocaine in these operations?

Dr. Younger. I have tried it in various forms, in the strength of four and ten per cent, but it is not worth the bother of using it. The surface was paralyzed, but beneath the surface the tissue was not affected.

Dr. Tenison. Have you tried injecting it?

Dr. Younger. No; I have no confidence in it.

Dr. Jarvie. This subject of implantation is most interesting to me, and I think all the gentlemen who were fortunate enough to witness the two operations performed on Saturday afternoon, while they may have imagined that the results might be successful, will be certain of it after seeing what we have this evening. I anticipated that the teeth we saw implanted on Saturday would become firm, but I did not think it possible that the result of any such operation could be as beautiful as those we have seen to-night. With as strong a light as could be reflected, there was no difference discernible in the color of the teeth. The teeth replanted and the tooth implanted were just as translucent as those that have never been disturbed. The question will arise in our minds, though the teeth are firm now, how long will they remain so? Probably all of us have had some experience in the replanting of teeth. I certainly have, and under varying circumstances and with varying results. I thought some of the teeth replanted would remain permanently firm in the jaw, but absorption finally set in, and in the course of from two to twelve years resulted in the loss of the teeth.

But perhaps the most interesting point to me in Dr. Younger's paper is the statement that dead tissue can be reorganized; that the pericementum that has been dried on the root of a tooth for months can again become the medium of circulation and nutrition.

The Origin of the Teeth.—If the hairs of the scalp were to be inserted into the skull, or the mustache into the upper jaw, we should express astonishment; yet such an extreme circumstance would not be more remarkable than the connection of the teeth with the jaw.—*Harrison Allen.*

FILLING TEETH.

DR. MORGAN ADAMS, SARDIS, MISS.

To insure success, it is absolutely necessary that every step be carefully and conscientiously performed. The first step in the operation is to "open" the cavity. This is best done in most cases, specially in large cavities, with heavy chisels, Dr. E. Parmly Brown's heroic chisels working most satisfactory in my hands. After cutting away such of the disintegrated tooth substance as is proper, shape the cavity for the reception of the filling. This must be done according to the situation and condition of the cavity. If it is in the grinding surface it is necessary to follow out all the fissures with fissure burs or otherwise. Leave definite walls all round if possible and avoid much undercut, but if possible leave enough to retain the filling. If it is the proximal surface be sure that you cut enough tooth substance away to prevent them from coming together again, except at a point either at the neck or cutting edge, as may be most suitable. This is of importance in favor of free separation. Now, see to it that the edges of all cavities are smooth. Do not bevel them very much, as there would be a thin edged filling which would break away and leave a receptacle for extraneous matter; but do not leave them sharp, as the thin edge of the tooth would crumble from the filling with the same result, thus inducing decay. Should you choose gold for the filling, drill small pits for starting points, and to retain the filling when there is not sufficient undercut. These pits are first filled and thoroughly condensed when you proceed to build up, being careful that each successive layer of gold is welded firmly on, thereby securing the integrity of the filling. Thoroughly condense the gold around the edges of the cavity, taking care not to bruise or stun (as sculptors call it) the tooth edge, but secure absolute contact of gold and tooth throughout. When the cavity is full to excess finish thoroughly, avoiding overlapping thin edges. Should you choose amalgam, the pits are not necessary except where the filling could not be retained without them. Having everything in readiness the amalgam is introduced in pieces of suitable size and pressed firmly home with smooth pointed instruments. From time to time press forcibly on the filling with a pellet of bibulous paper, which will force the mercury to the surface, and the next piece of amalgam will adhere better. When the cavity is full, press out all excess of mercury, as before directed, and take up the little globules that can be seen on top with a layer of tin foil. Finish in the usual way, leaving no excess of material to overlap the edges. Leave the teeth shaped so that they will not come together after filling proximal surfaces, for the best work will fail if this is neglected.

I am indebted to Dr. Bonwill in part for this method of using amalgam.—*Miss. Trans.*

RUBBER AND THE NEW SELF-PACKING VULCANIZER.

G. P. RISHEL, D.D.S., HORNELLSVILLE, N. Y.

All vulcanizable dental rubbers are of the same general composition, consisting of a mechanical mixture of caoutchouc and sulphur, with perhaps certain metallic sulphides and oxides, such as vermillion, oxide of zinc, white clay, silicate of aluminum, in different proportions. Seventy per cent. of caoutchouc to thirty per cent. of flowers of sulphur is the general formula for black rubber, and may be said to form the basis of all dental rubbers with the exception of soft rubber, which contains a smaller percentage of sulphur.

Vulcanized rubber is the result of a chemical combination of caoutchouc with sulphur, the change being produced by the application of heat and pressure within the vulcanizer. A somewhat smaller percentage of sulphur than is contained in the *mixture* combines chemically with the caoutchouc, because some of it forms other combinations and escapes into the vulcanizing chamber. The amount of sulphur which escapes from a given amount of rubber, is in proportion to the size of the vulcanizing chamber and therefore the *larger the chamber the higher the temperature required to vulcanize within a given time.*

The proportion of sulphur may be so reduced by a badly leaking vulcanizer that vulcanization will not take place. Porous rubber is always the result of vulcanizing at a high temperature, and is often produced by actually burning the vegetable portion of the compound ; but, as a result of chemical change the rapid and therefore *forced* escape of sulphurated hydrogen gas produces an effect on the rubber similar to that of bread made porous (light) in a similar manner.

For this reason rubber under pressure is less liable to be porous, and for this reason the best results can only be obtained by using a self-packing vulcanizer which by a *constant and increasing pressure finishes* the work of closing the flasks at a comparatively high temperature, (285° to 300°) insures a better quality of rubber, and prevents the breakage of blocks.

The various dental rubbers in the market are supposed to require one hour at 320 degrees of heat, but owing to the imperfect conductivity of air, which rises to the top of the chamber, and because of imperfect circulation remains there, the *actual temperature* is ten to fifteen degrees higher than is shown by the thermometer.

The injurious effects which result from valcanizing at a high temperature are not confined to the quality of rubber, for it must be remembered that it is a material which shrinks to a remarkable degree in cooling, and in exact proportion as the degree of heat employed in valcanizing, differs from its final resting place—the mouth.

Much has been said and written upon the various methods of taking impressions, of making air chambers, of trimming impressions and models to secure a perfect adaptation; but the prime factors in the problem have been practically ignored; for, vulcanizing at 335 degrees of heat, then suddenly plunging the vulcanizer in cold water is a very sure way of producing missfits and broken blocks.

The *gradual* lowering of temperature allows the molecules to rearrange themselves with the least possible strain at any one point, with better fitting plates, and a smaller percentage of broken blocks as a result.

Let it be once thoroughly understood that time saved by high heat, and quick cooling is doubly lost, and a great advance will be made toward the proper manipulation of rubber.

Dark joints may in some degree be avoided by filling them with a creamy mixture of plaster, and making large waste pockets with gates *opposite the joints*; but to insure absolute and certain success, avoid spreading blocks by carefully and gradually closing the flasks when the rubber is in its most plastic condition, which can be most successfully accomplished by using the "Self-Packer" I am about to describe:

Fig. 1, is a central vertical section of my improvement with the flasks in position and the apparatus ready for heat to be applied.

Fig. 2, is a similar view, showing the flasks closed, and the inner cylinder at the end of the up-stroke.

Referring to the drawings, in which similar letters of reference indicate like parts in both the figures, A indicates the exterior cylinder, which for convenience, will be designated as the "boiler cylinder;" and B the inner chamber or cylinder, which I call the "piston cylinder."

The boiler cylinder A, near its upper extremity, is of increased diameter to form a packing chamber α , and has an interior threaded portion, which engages a threaded annular flange upon the cap C.

As the cap C is screwed down into the boiler cylinder, the annular flange compresses the packing in the packing chamber and makes a steam-tight joint.

Formed upon the inner surface of the boiler cylinder is a horizontal annular flange A¹, which serves as a guide to the piston cylinder B which moves therein.

The boiler cylinder is provided with a suitable safety valve α^1 , and a steam-tight plug α^2 which can easily be removed when the outside chamber is to be filled with water.

The piston cylinder B has a closed bottom, and is composed of a main cylindrical portion, which is of slightly smaller diameter than the interior of the boiler cylinder A, covers the packing chamber and forms the real piston surface which operates within the packing.

In the operation of the apparatus, the inner chamber or piston cylinder with its closed bottom moves upward, and therefore provision is made whereby the steam and air can escape from the interior of the

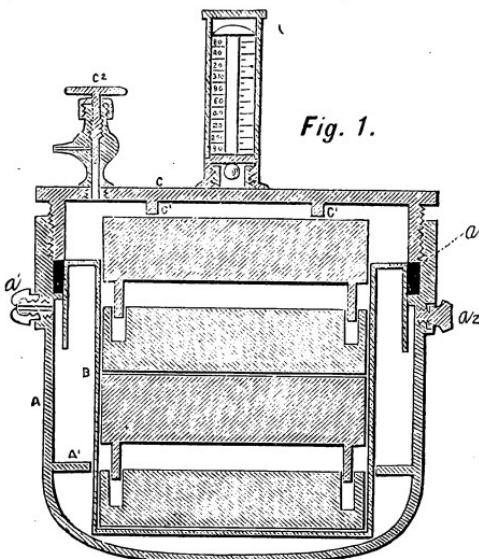


Fig. 1.

inner chamber or piston cylinder to relieve the pressure and obtain the *complete or full stroke* of the piston and *absolute certainty* of closed flasks.

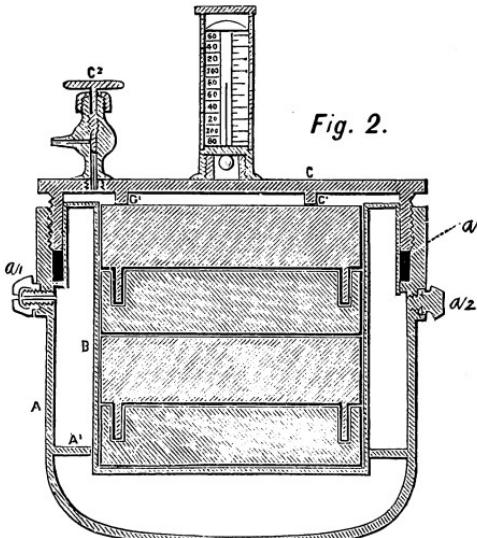


Fig. 2.

The peculiar shape of the inner cylinder secures a larger piston with a proportionate increase of power, additional height to the outer steam chamber, and uniform temperature for the vulcanizing chamber;

it also reduces the difference between the two chambers to the minimum (about 7 degrees when the thermometer registers 320).

The boiler cylinder is made of extra heavy copper, seamless throughout, and capable of sustaining a much greater pressure than the utmost carelessness can possibly subject it to. It is absolutely protected from the injurious influences of sulphur (which makes sad havoc with the ordinary vulcanizer) and can never become thin, and therefore, dangerous by long and constant use.

The piston cylinder is also seamless throughout, "being pressed up" from a single piece of copper, and nickel-plated.

The flasks which are large and somewhat resemble those used for celluloid, almost fill the vulcanizing chamber; a feature which I believe to be of considerable importance, and which cannot be obtained when bolts are used to close or hold the flasks together.

The vulcanizer as a whole is a simple, compact, and portable machine, which will do better work, and in less time than any other vulcanizer in the market. The outside chamber should be filled with water and made steam-tight, and may possibly need to be refilled once a year. Place one flask upon the other, cover them with the boiler, draw to the edge of the bench and with one finger beneath the flasks to prevent them from falling out, invert the boiler, pour about six drams or a thermometer cap-full of water over the flasks, screw down the vulcanizer cap and apply heat; when the thermometer registers about 260 degrees of heat, open the steam valve C² for about fifteen seconds and proceed as with a Whitney.

The small amount of water used in the vulcanizing chamber is quickly converted into steam, thus furnishing a circulating medium, and that which is of still greater importance, a counter pressure which prevents the piston cylinder from moving upward until the rubber is very soft and it is desired to begin the moulding process. Having served its intended purpose, it is allowed to escape and the chamber is refilled by dry steam drawn from the plaster moulds.

Under no circumstances is it deemed advisable to cool too suddenly; but if it is thought to be necessary to hasten the cooling process, blow off steam from the inner chamber for about five minutes, or until the thermometer registers 260 before immersing the vulcanizer in cold water.

Mr. Clement Carpenter, formerly Secretary of the American Legation at Santiago, Chili, and just home from South America, says Chili is a paradise for dentists, who live like nabobs in the finest palaces, drive the finest equipages, and stand high generally. The Chilian ladies are wealthy and extremely vain, and as a rule do not have good natural teeth. The Argentine Republic is also an inviting field.

PAIN OBTUNDERS.

DR. A. W. HARLAN, CHICAGO, ILL.

It has long been the desire of every dentist to excavate cavities in teeth painlessly, but the fruition of that desire I fear has not yet arrived, except in pulpless teeth and such superficial cavities as are found in the fissures of bicuspids and molars. It has been stated on several occasions that, by drying a cavity and by the use of a sharp excavator, all that is necessary for the obtunding of the dentine has been done, but such is not the fact in all cavities. I believe that it is essential to thoroughly dry cavities in general before much excavating has been done, to avoid producing pain, but complete dryness is not sufficient, not even when the air is continually heated.

It is not practicable to produce a continuous stream of heated air unless you have it compressed, or have a compressor attached to a steam heating apparatus, or have a foot-bulb which a water or other motor will put in motion, so as to have a steady stream. It is not certain that the use of heated air for any considerable length of time may not be injurious to a tooth, by driving off too much moisture and checking the enamel so seriously as to produce leakage around a gold filling. I think I have seen evidences of this in pulpless teeth at any rate. The only practical method of using heated air for obtunding sensitive dentine is to direct the jet on the cavity for a half to a whole minute, and then introduce with a pipette or dropper the obtunding agent, which may be alcohol, ether, carbolic acid, in a generous solution, or other local anesthetic. This should be continued for about two minutes, and in most cases the patient will not shrink when the excavator is used. The rubber dam must be used in every case. This method of using heated air is, I believe, entirely new and original with the writer. Every one must remember some case where it seemed impossible at the time to properly prepare the cavity in a tooth so that a respectable operation could be performed. This method will undoubtedly help some one in just such cases. You cannot accomplish much by using an ordinary bulb-syringe. One of Glow & Young's air compressors, or C. Beseler's, or some other make, whereby you can have a pressure of from forty to sixty pounds to the inch, will be all that is needed. If the heated air is directed from the cylinder, the pipe or taps must be protected with a non-conductor by having a coiled tube about eighteen to twenty-four inches from the mouth of the patient; a small gas jet or spirit lamp will produce all the heat needed. As the stream of air comes from the compressors through the heated pipe, you can have a small thermometer attached, and can easily regulate the degree of heat; that portion of the pipe nearest the mouth must be covered with a non-conductor, to protect the lips and face.

A sheath of asbestos paper or bone can be used, so that it need not touch the heated pipe.

In the use of any agent for obtunding sensitive dentine, dryness is absolutely required. Time is another factor; I do not always feel that I can afford to wait for an obtunder to act, and many patients certainly cannot, therefore we seek for a rapid and safe method of depriving dentine of its sensibility. No doubt you are all acquainted with the most recent addition to the list of obtund ng agents. This includes the various forms of cocaine, of which I shall say nothing, cannabis indica, and the oleo-resin of Kora-Kora. In times gone by I have experimented with and used the ethereal oils, separately and combined, carbolic acid crystals, both cold and heated, cetylized potash and glycerin, chloride of zinc, sulphate of zinc, camphors, including menthol, hydrate of chloral, ether, alcohol, tincture of aconite root, and other vegetable tinctures, prepared chalk. and other antacids, iodoform, iodide of potassium, glycerin, chloroform, and many other agents, some of which were secret anesthetics, and hence valueless. Occasionally some one of the above substances would prove of value, but when most needed they could not be relied on. The principal difficulty has been that obtunding agents either required too long a period of waiting to obtain results, or they were themselves productive of pain. The latter is particularly true of those drugs or agents that rapidly abstract water, or are escharotic. For these reasons the majority of the above cannot be relied on for destroying sensibility in dentine.

Preparatory to the use of an obtunder the cavity should be opened with a chisel and the debris washed out with warm water, the rubber dam should then be adjusted, and if the necks of the teeth are sensitive or the gums tender, they ought to be painted or swabbed with the tincture of cannabis indica slightly warmed. The cavities should then be dried, after which pellets of cotton moistened with alcohol may be introduced and quickly removed, and the obtunder, whatever it may be, should then be placed in the cavity and allowed to remain while you are operating on some small fissure or other non-sensitive cavity. By so proceeding you inspire the patient with confidence, gain time for the drug to act, and allow the alcohol to evaporate, which is in itself a tolerable obtunder. By preference, and from confidence in the drug, I am still using the fluid extract of cannabis indica. I find that, used in the above manner, it acts more rapidly than any other known drug which is not injurious to the teeth. In previous papers I have cautioned against a very free use of the fluid extract, as it is poisonous in large doses when accidentally used, one-half to one drop being the ordinary dose, while five to twenty drops of the tincture may be given with safety.

You will find the tincture of cannabis indica and the fluid extract are extremely valuable in other directions than that of obtunding dentine, as you can open an abscess almost painlessly by pricking its surface two minutes before introducing the lancet. By soaking a pulp with the fluid extract for a few minutes you can remove it without pain, provided you have free access to it, so that the brush can be plunged into the canal without unnecessary fumbling around the entrance. You can use the tincture for injections around the root of a tooth, when there are fine deposits on the sides which would cause great pain in removal without its use. I habitually make great use of it with perfect results. I have extracted a few roots of teeth by injecting a drop on each side, and also painting the gums adjacent to the roots, and waiting for five minutes before removing them. The tincture should be warmed before using it for this purpose.

The oleo-resin of Kora-Kora I have used for obtunding the soft tissue and dentine to a limited extent, but it is so disagreeable to use, being greasy and having a bad taste, that I am at present seeking for some method of preparing it so that it will not be so nauseating. You can get it from Parke, Davis & Co., and see what merit it possesses for the above purposes. So far, I am certain that it is less efficient than cannabis indica. In conclusion, allow me to say that at present it is possible to prepare and fill cavities in teeth without the destruction of the pulp, which, in many cases before obtundents were properly used, it was impossible to fill with any degree of satisfaction to the operator, and often such operations were of little benefit to the patient.

—Independent Practitioner.

A REMARKABLE CASE OF IMPLANTATION.

DR. W. J. YOUNGER.

A statement in regard to an implanted tooth that had been out of the mouth for thirteen months, may be of interest. The pericementum around the root was quite dry and like parchment. I told my patient it was impossible to make that tooth grow; that I trusted entirely to the vitality of the pericementum to obtain a living union, and that on this tooth the pericementum was as dry and lifeless as parchment; therefore it would not succeed. Just as I had persuaded her that success was impossible, a certain passage in John Bell's work, where he criticises Hunter, came into my mind. It did not bear directly on this subject, but it suggested the thought that perhaps after all there was in that dry parchment-like pericementum some germ of life that might become, under proper conditions, awakened, and its energies renewed; and so I told the lady that I would try it as an experiment. So, in the presence of Dr. Warner, of San Francisco, I

drilled a socket and implanted the tooth. The lady commenced eating on it, and in the course of twelve days she became careless and in biting on a crust of French bread the tooth was so wrenched that it became quite loose. Violent irritation followed, and the gum bled profusely, especially on the palatine surface. She came to me crying. The tooth was so loose that I could move it in every direction; still it did not drop. I was anxious to test whether the pericementum was really alive and had formed a living union, or whether it was simply the nice adaptation of the walls of the socket to the root that retained the tooth in place. So I did not tie it, but only touched it with iodine and told the lady to be careful not to eat on that side. In the course of a week it commenced to tighten; in two weeks it was quite firm, and now it is solid. That operation was done last March. I tried to pass between the root of the tooth and the tissue of the gum a delicate flat instrument, to see whether the tooth was held mechanically or by living union; but I could not get the instrument up, and the attempt caused pain. It seems to me that the fact that this tooth became firm the second time, and the fact that I could not get an instrument between the gum and the root, proves that vitality was awakened in that pericementum. Absurd as it may seem, it must be so.—*Cosmos*.

FLASKING.

Editor ITEMS:—In reply to Dr. J. A. Robinson, on page 553 of December ITEMS, I use the wet heat for closing flasks. I first warm the flask, then pack and place flask clamp and all in warm water and place water and all over a flame and allow it to boil for two or three minutes, remove and turn the flask on one side to drain, then close. If rubber is used in excess the flask will not close, or if it will close, the unnecessary pressure will cause dark joints. Also avoid placing the flask in hot water if the flask and teeth are cold, as the sudden change of temperature will cause a fracture of the teeth, otherwise they will be perfect.

L. MILLIRON, Kimball, D. T.

Esophagotomy.—Prof. L. McLane Tiffany, of the University of Maryland, successfully performed this operation the other day for the removal of a rubber plate of four incisor teeth, for a man who had partially swallowed it. The plate had been in the throat three days, and had defied all efforts at removal. In the presence of the students, the patient was etherized, the esophagus opened, and the plate removed. The wound, being properly ligatured, healed, and a normal condition of the parts soon took place.

The Dental Section to the International Congress. The *Cosmos* referring to the closing exercises of the First District Dental Society of N. Y. says: We have reserved for a closing paragraph allusion to an incident which was a surprise both to the society and its guests. Dr N. W. Kingsley, availing himself of the opportunity afforded by a call to respond to a toast, announced that he had something to eat not on the *menu*, and proceeded to say that he desired to recede from the position taken in the paper recently read entitled "Dentistry Not a Specialty in Medicine." He acknowledged his conversion, and his willingness, however unpalatable it might be, to eat his own words, not only withdrawing all opposition to the Dental Section of the International Medical Congress, but pledging himself to give it active and hearty support. The announcement was greeted with more enthusiasm than had been created by any other utterance, and the applause was general and without any indication of dissent.

This unexpected sommersault and the manner in which it was received mark the withdrawal of all effective opposition to the Dental Section, and insure its success. The project, which has been discussed in several quarters, for an International Dental Congress, in lieu of a Dental Section in a Medical Congress, it was understood should be temporarily left in abeyance, and meanwhile all were urged to concentrate their efforts to make the Section of Dentistry in the forthcoming Medical Congress a credit to the dental profession.

If the meeting of the First District Society had had no other outcome but this reconciliation of opposing elements, it would still be entitled to congratulations and thanks.

Hamamelis Virginica.—There is no phase of hemorrhage, scarcely, but that it is applicable, especially in those from the uterus, the lungs, the stomach, and the bowels.

The vast amount that is manufactured, sold, and used of this drug is truly wonderful. It is said that one firm alone has put millions of bottles on the market, and yet the profession and the public cry for more. To say that iron, tannic acid, or gallic acid, will do what hamamelis will do, is not borne out by experience. Hundreds and thousands of remedies have arisen and had their day of notoriety and decline since hamamelis began its course and it is still holding on its way.—*D. A. Colton.*

South light for the dental chair is the most trying we can have. A north light is the best. If a south light is necessary, an awning should screen this window from the direct rays of the sun. There are now some very neat and pretty ones on the market. It should be on a frame that is easily thrown up when extra light is needed.

THE ELEVATOR.

DR. G. W. ADAMS, BRISTOL, PA.

About twenty years ago, Prof. Buckingham of the Pennsylvania College of Dental Surgery brought this instrument before the class, in one of his talks on Extraction. It was then entirely new to the writer, and, for aught he knows, to all the rest. He dwelt in detail on its merits, extolling its simple construction, and the power it possessed to overcome resistance when skilfully used.

In extracting the lower wisdom teeth, when the second molars are in position, perhaps its use becomes more especially demanded ; though it may be used in many other cases to great advantage ; and with little pain to the patient. I had a case to-day. A young lady desired the shelly root of the right inferior third molar taken out. The tooth was "all gone" down to the alveolus, except the anterior wall, which stood immediately behind the second molar ; and the root was hollow nearly to its apex. She wanted to "take gas," for she had a terrible dread of the forceps, or of having the "gum cut." I saw at a glance that the use of the forceps would be a sure failure, unless the gum be cut (or torn) unmercifully. So I discouraged the administration of gas, and showed her the elevator and explained to her how I designed to use it. After securing her confidence, I gently embraced her head with my left arm, and placed the end of the elevator (in my right hand) against my breast, and with gentle force I inserted the point of the instrument between the teeth, with its concavity toward the offending organ, rotating it slightly at the same time. In less time than it takes to tell it, the root was lifted out, without the patient suffering much pain or losing much blood.

The lower wisdom teeth are generally "bent with age ;" and the roots in some cases incline greatly backward. By placing the concave side of the elevator against the root and its convex surface against adjoining tooth which is used as a fulcrum, this instrument brings into play two of the most powerful forces of Natural Philosophy—the Lever and the Wedge, or double inclined plane ; and as the elevator is turned horizontally, it must *lift the bent tooth*, and cast the crown backward, giving the root a chance to creep out of its crooked socket.

FATAL POISONING BY COCAINE.

Dr. W. H. Long recently reported to the Detroit Academy of Medicine, a fatal case of poisoning by application of cocaine to the larynx. The patient, a man, had been treated with nitrate of silver applications and spray of Lugol's solution for inflammation of the larynx. Spasm of the glottis subsequently occurring, relief was obtained by the application of a four per cent cocaine solution. Seen two hours

subsequently he was resting quietly; an hour and a half later he was unconscious. His breathing was somewhat labored; respiration 20; pulse 90 and moderately full; pupils slightly contracted. The lungs were well filled with air with each inspiration, and the general condition was one of profound anesthesia. The first thought was of asphyxia; but as that was excluded, the doctor slowly arrived at the conclusion that he had to deal with cocaine poisoning. Frequently repeated hypodermic injections of whisky restored the patient to consciousness, and the next morning he had fully recovered. The former treatment was resumed with temporary good effect, followed by another relapse. Cocaine was again resorted to, with precautions before neglected, so that swallowing the solution or undue absorption was supposed to be prevented, and the strength of the preparation used was only two per cent. Anesthesia again followed; injections of whisky revived the patient, but he suddenly ceased to breathe, and all efforts at resuscitation proved unavailing.—*Druggists' Circular.*

FILLING SENSITIVE TEETH.

After preparing the cavity and securing good under-cuts, mix a small quantity of Welch's cement to about the consistency of cream, and carry a portion of this to the floor of the cavity on the point of an excavator, then immediately place on this a pellet of gold foil of sufficient size to nicely cover the bottom of the cavity. After the cement is hard consolidate the gold, pressing toward the cervical walls of the tooth and into the undercuts, using hand pressure. Add more gold, and continue the operation as usual till completed. The first layer of gold unites to the tooth with such tenacity that it is impossible to remove it without tearing the gold. The cement also serves as a nerve capping, and the pain resulting from drilling retaining points is entirely avoided. In this manner gold fillings can be inserted in sensitive teeth with little pain and be made secure. This method is also admirable for filling large crown cavities and in starting gold fillings in artificial teeth.

J. WESLEY MAUKE.

Manipulating amalgam as well as gold, is subject to skill. If so dry as to be crumbled, by heating the burnisher and the instrument rotated à la Herbst, it will be spread easily and perfectly; and, if the amalgam is good, there will be no leakage.

—A traveler in one of the hotels in Bangor, Me., put his false teeth in a glass of water when he went to bed the other night. In the morning the water was frozen solid, and, as the water pipes in the house were also frozen, he had to take the glass in bed with him and thus thaw the ice before he could go to breakfast.

"GOLD AND TIN AS A FILLING."

Tin is an excellent filling by itself on proximal surfaces. It is too soft for *grinding* surfaces, requiring removal in two or three years. The salts of tin are antiseptic, and so preservative of dentos. If a tin filling leaks, the rust fills the openings of the dental tubes. As the rust occupies more space than did the metal which formed it, the leakage is lessened, if not entirely prevented. Forty years ago I filled thousands of teeth with tin. The reason that I used tin so much was on account of the poor quality of amalgam in those years. The best of amalgams I now regard as better than tin for preserving the teeth. Tin twisted into a rope with gold forms a filling which must become porous, for gold and tin united form a galvanic battery. The tin is the positive element, and so, of necessity, must become disintegrated. Tin will not last well in such a union.

The gold is the cause of the tin's rapid destruction. Tin alone placed next to a cervical wall will do good service. But if gold is added to a layer of tin thus situated the result is not good, for the two metals still make a battery, and the tin will sooner be disintegrated than it would be without the gold. A filling thus made is far more preservative than one of gold touching the cervical margin. A battery of this kind is not productive of pain in the tooth. But a filling thus made is much better for the preservation of the tooth than one of *all* gold.

HENRY S. CHASE.

St. Louis.

Replanting Deciduous Teeth.—Dr. Gustavus North, of Iowa, writes: We seldom hear much regarding replanting deciduous teeth, but circumstances sometimes makes it desirable.

About four years ago a little child two years of age, accidentally had her right upper central incisor knocked out. Soon after the accident occurred the detached tooth was replaced and secured. The tooth soon became firm and useful. A few days ago the child was in again. I found the left central incisor removed, and the permanent tooth making its appearance. The root of the replanted tooth was absorbed, the tooth simply attached to the gum. This was removed, and the permanent tooth was found ready to erupt. There had been no discoloration, and absorption had taken place normally.

Springville, Linn Co., Ia.

GUSTAVUS NORTH.

Dr. C. W. Spalding of the *Archives*, and one of the most prominent and intelligent dentists of St. Louis, has been quite sick with malaria for more than three months.

DANGEROUS LAUGHING GAS.

DANVILLE, IND., Jan. 28.—A sad result of the taking of "laughing gas" for the purpose of having teeth extracted has occurred here. William Hammond, a popular young business man of this place, recently of Clayton, Ind., is the unfortunate person. Since taking the gas yesterday he has not been able to talk or move any part of his body, except to make a slight motion of the head. He remains perfectly conscious, but when spoken to can only answer by nodding or shaking his head from side to side. It is painful to see the distressing expression that covers his face when he attempts to speak and finds that he cannot. He is about 27 years old, and the only support of a widowed mother.

POISON IN RUBBER.

Editor ITEMS:—Enclosed please find one dollar for renewal of my subscription. I could not sleep well nights if I did not have the ITEMS monthly. But to change the subject: this rubber sore mouth business is all bosh. I have been making rubber plates for twenty-five years and never saw a single case in my life, and never heard of one till the gold lining was introduced. They may fool some of the boys but can't scare off the old vets. Yours respectfully,

Mathews, Va.

N. M. CHATHAM.

It is a good plan, after wedging the teeth apart, preparatory to filling, to fill the cavity with oxyphosphate cement or gutta-percha, and extend it across the space between the teeth, so as to hold them firmly apart for a few days,—till the soreness produced by the wedging has subsided, before filling with gold.—*S. F. Duncan, Wilmington, Ill.*

"In choosing a good cement there are three tests. 1st, It should adhere firmly to the spatula when hardened; 2nd, Should not stick to the fingers when being molded into pellets; 3rd, Should rebound when thrown on the floor (after having become nearly hard). In manipulating cements, the use of an oil pad for moistening instruments will be of much assistance. Fillings should be varnished, to prevent contact with moisture before hardening.—*C. H. Wachter.*

Caulk's Annual appears this year in increased size. Dr. L. D. Caulk, Camden, Del. Price 50 cents. It has 96 pages, devoted to statistics of dentistry.

For Our Patients.

TEMPORARY TEETH.

A Few Words to Parents.

J. RICHARDSON, D. D. S.

Reader, have you a little boy or girl from two to four or five years of age? If so, you will find, on looking into the mouth, that the child has, in all, twenty teeth; ten in the upper, and ten in the under jaw. These first sets of teeth are known by various names, as, *Infant*, *Milk*, *Temporary*, or *Deciduous* Teeth. You have doubtless watched the cutting of these teeth from first to last with great anxiety and concern, for their eruption embraces a period in the child's life often fraught with danger, and nearly always with some derangement of the health. But now these teeth are cut, it may be you have entirely dismissed your concern, and imagine there is no farther need of watchfulness,—that they are *only the first set*, and as they will be replaced by the permanent set, no farther attention to them is demanded of you. Now the purpose of these lines is to impress on you the necessity of watchfulness with a view to the preservation of these teeth till they shall be replaced by others.

The active service of the temporary teeth, previous to being shed, embraces from four to six years, during which the child is dependent on them for the mastication of food. While you doubtless recognize the importance of the care of your own teeth, you should remember that good, sound teeth are even of more importance to your little one. Why? You have acquired your growth; your system is developed and matured; the vital functions are strong to resist the encroachments of disease, and the operation of causes that would scarcely induce any irregularity of health in you, may be sufficient to destroy your child, or to render it an invalid for months or years, or for life. The child is *developing* and *growing*, and any injurious influence sufficient to modify or change the natural and healthy order of that development and growth, may enfeeble the constitution and lead to the establishment of some grave and incurable disease. The nourishment you take is designed chiefly to supply the *waste* that is going on in the system continually; but in your child, food must be taken to compensate for this waste, and also for the *growth* of the body.

How is this increase of the body effected? By a process called *nutrition*. It is not thought necessary to consider here the series of vital acts engaged in the conversion of alimentary materials into the various tissues of the body, and which, in the aggregate, constitute the function of nutrition. Nor do we think it necessary to enumerate the

many causes that may operate to modify, interrupt, or pervert the nutritive functions, but your physician will tell you that among the chief is *imperfect digestion* of the food taken into the stomach. And he will also tell you that what is taken into the stomach in the form of alimentary substances, is never prepared for easy, rapid, and complete digestion without having been previously well masticated and thoroughly mixed with the juices of the mouth.

Have I succeeded in making it plain to you how important is this first and primary operation of mastication, in which the teeth play so essential a part,—how thorough mastication is necessary to good digestion,—how good digestion so largely influences the healthy nutrition and growth of the body,—and how, by imperfect or perverted nourishment of the system an enfeebled or vicious constitution may be bequeathed to your child, and the seeds of disease sown in early life that may compromise the well-being of your offspring for all time? These facts are presented for your earnest consideration, that you may better appreciate your responsibilities and duties toward these little ones whose helplessness and dependence so strongly appeal to you as their natural guardian, and whose highest interests and welfare in all that concerns their present and future happiness and usefulness, you cannot knowingly slight and be esteemed guiltless.

If it be true that the uses of these first teeth are so important, you will at once appreciate the necessity of preserving them in good, serviceable condition till the appearance of the second set. There can be no proper preparation of the food in the mouth if the infant grinders are prematurely lost, or, are much diseased or broken down by decay, or so sensitive that the child is thrown into pain when it masticates solid food. To avoid this suffering, a habit of "bolting" the food will soon be acquired, and this will pass into the stomach in a crude state, unmixed with a proper proportion of saliva, producing serious derangement of the stomach.

We have now presented the most important reason why the temporary teeth should be preserved. There are other reasons, of minor concern perhaps, but which are worthy of consideration. The suffering which children endure from toothache is certainly not less than that experienced by the adult, and to save a child from such an infliction is demanded by a feeling of common humanity,—how much more so when the little sufferer is the object of parental affection and solicitude. Early and constant attention may save your child this sad experience, and secure its exemption from a very common and distressing disorder, and yourself from many sleepless nights and hours of harassment.

Again, the still sadder misfortune of being obliged to have aching

teeth removed, presents an additional motive to you to give your attention to these teeth in time. The dread of dental operations we believe is more frequently acquired in childhood than at any other period. The impression of early suffering is often abiding, and it is difficult to persuade them in after life, that *all* operations on the teeth are not alike *horrible*. It is often only by a *new* experience that they are taught otherwise, and before that is acquired, many good teeth are permitted to decay hopelessly, and are sacrificed.

Finally, these first teeth should receive early and constant attention to prevent their *premature* loss. You should adopt every means to retain them in the mouth till, in the natural order of things, they are to be replaced by the permanent organs. As the crowns of the second set advance toward the surface of the gum, the roots of the first teeth are gradually absorbed, so that the latter, when the proper time arrives, may be easily removed; in most instances, they may be picked out with the fingers, inflicting little or no pain. The early loss of the first teeth should be avoided for several reasons. They subject the child to violent pain in extracting them, and make them ever afterward timid and fearful of really unavoidable operations. Mastication is rendered more and more imperfect with every tooth lost, the pernicious effects of which we have already pointed out. A final reason why these teeth should be retained till the processes of nature indicate their removal, is, that their continued presence is necessary to the complete and perfect development of the jaw, on which depends so much the beauty, regularity and health of the permanent teeth. The jaws grow and expand as other parts of the bony system, but to do so properly and symmetrically, the natural processes of the system must not be interfered with. If your little child loses a tooth at three years of age, the nutrition of all the parts around that tooth will be so modified or interrupted that there will be retarded growth and development of the part, and instead of gradually expanding at the same rate as other parts of the jaw, the space will remain nearly the same down to the time when the tooth of replacement comes forward, and consequently relatively less room for the permanent tooth. It is in this way the second teeth take their place in the jaw in a crowded and irregular condition for the want of adequate room, whenever any number of the deciduous teeth have been prematurely removed. Irregularity of the second set occurs most frequently, because the first are lost *too soon*, rather than from having them retained *too long*, as is often supposed.—*Allport's Journal*.

The investment made in the fish hatcheries in New York, the Commissioners figure, has returned fully 1500 per cent.

Cocaine poison.—A highly esteemed physician of Springfield, Pa.—Dr. C. N. Moore—resorted to the regular use of cocaine a year ago for allaying a troublesome pain. For six months the effect was satisfactory. Suddenly he experienced singular hallucinations. These recurred and became increasingly dreadful. He discontinued the use of the drug, but his mental sufferings continued, and he became maniacal. At latest accounts he was lying at the point of death. His physicians are divided in opinion as to the cause of his madness, but most of them trace it to the habitual use of this deadly drug.

WHAT BARRED THEM.

HE.

I saw this book of paltry verse,
And asked to take it home—and so
She lent it.
I love her deep and tenderly,
Yet dare not tell my love, lest she
Resent it.

I learn to quote a stanza here,
A couplet there. I'm very sure
'Twould aid my suit could I appear
Au fait in books and literature.
I'll do it!
This jingle I can quickly learn;
Then, hid in roses, I'll return
Her poet!

SHE.

The hateful man! 'Twould vex a saint!
Around my pretty, cherished book
The odor vile, the noisome taint
Of horrid, stale tobacco smoke
Yet lingers!
The hateful man, my book to spoil!
Patrick, the tongs—lest I should soil
My fingers!

This lovely rose, these lilies frail,
These violets he has sent to me
The odor of his smoke exhale!
Am I to blame that I should be
Enraged?
Tell Mr. Simpson every time
He calls upon me, Patrick, I'm
Engaged!

Arthur Lovell in the Century Magazine.

Editorial.

HAVE SOME SIDE SHOW.

Round and round in our little sphere of business we go, hardly deigning to look out at the beautiful in God's sunshine, or to take time to see the flowers laugh, to hear the birds sing, or to feel the balmy zephyrs; nothing is allowed to relieve the monotony of life's stern duties. Thus our work becomes wearisome, interest in our most important duties flags, and pleasure in life itself departs. How foolish.

We should be willing to do right down hard work, and plenty of it; yes, and even the drudgery of life; but how good it is to mingle with all a little pleasure. It is wholesome as well as pleasurable once in a while to step outside, and see how the rest of the world moves; to really have some fun and give a little to others: to play with the children, romp with wife, and jump and whoop with the boys, go swimming, go boating, go anywhere in the pursuit of innocent pleasure and recreation. It restores the appetite, stimulates digestion, purifies the blood, invigorates the organs, expands the intellect, brightens the wit, cheers the spirits, skills the muscles, steadies the nerves, and gives normality and brawn to the whole man. It prevents gout, dyspepsia and melancholy; keeps old age green, puts selfishness to the blush, and rubs off sharp angles.

Don't go to the other extreme, and make all life a side show. Too many have no distinct, useful, all-absorbing business, and become mere "children playing in the market place;" or if they have a business, neglect it for trifles. They become themselves such trifles that the wind blows them away as chaff. But we do see the benefit of having some subordinate attraction, some avocation to relieve the tedium of our vocation. It is wrong to make life a treadmill, and to think all time spent outside this is wasted.

When we were preparing for professional life, we taxed our energies to their utmost and exclusively to accomplish our purpose, and when we entered that life everything irrelevant was pushed aside. Day after day, and week after week, and month after month, our mind and body were skilled and used for this single routine employment. We were a dentist, nothing else. No wonder we became a regular spindle shanks and was finally pronounced consumptive. No wonder we became more and more a physical, mental, and moral dyspeptic, with nerves on tension, mind hypersensitive, disposition soured and life a rack. At 35 years, when we should have been in the glory of our manhood, we were ordered out of our office, by a council of the best physicians. It was only by waking up to this idea that we should

have a side show, where betimes we could limber up—"laugh and grow fat"—that we saved ourselves. It was necessary to get outside the environment of our business and to bring into activity thoughts, aspirations, faculties and muscles usually dormant.

Most of us need something of this kind; for by overworking some of our muscles, faculties, and energies, and allowing others to be habitually idle, our whole character becomes unbalanced, our view of life becomes distorted, our judgment becomes warpt and our passions become abnormal. We need something that shall occasionally draw us out of the pent up, secluded atmosphere of our office, and oblige us to inhale the glories of the outside world; that shall, at times make us forget our professional self, by being engrossed in something radically diverse.

This side show need not be anything foolish, senseless, or unbecoming. There is no need of compromising our dignity, our honor, our self-respect. Neither are we advocating exhausting excitements, dissipating indulgences, and questionable associations. Whatever we do, let us be rational, innocent, manly.

Every one of us has some taste or inclining which if developed will give us a side show in which we can relieve ourselves from the weight of our main business, and be enjoyable. We will thus develop some useful trait,—give inspiration to some natural bent, exhibit some peculiar characteristic,—that shall give variety, pleasure, and even sparkle to life. Is it invention, science, physics?—botany, geology, or some other investigation?—a garden, a museum, or a mere henery or an apiary?—an artificial fish-pond, architecture, surveying? There are a thousand diversions, but not a thousand for one person. I know a dentist who roused himself from chronic exhaustion into health and vigor by the stimulus of spending two hours a day on the street comparing, pricing, and dealing in real estate. He had tried to find rest and recuperation in inaction; his physician said it must be in pleasurable outside activity; something that would call him out of his shell, and give him a new field of thought and life and inspiration. Feeling of himself he thought this was the direction for *him* to find relief and it proved to be *his* fort. We know another who made himself happy, useful, and healthy, by becoming interested in public schools. He came into them as sunshine, roused teachers and scholars as by magnetism, suggested methods which united monotonous and mysterious theories to interesting and easy practice; and as the public saw his usefulness and put him on the school-board, it soon became an astonishment to all that he should have so long buried himself in his dental office. Yet all this to him was but a side show. Even politics may benefit you and others also, if you are on the side of the home as

against the saloon, purity as against corruption, and the highest type of civilization as against the thousand and one excesses that tend to make civilization worse than heathenism. There are broad fields in which to limber up in literature, in public speaking and writing, and in social intercourse with refined society. I remember one who became notably useful and happy in becoming interested in improving the vilest part of his city. Shake yourself from your seediness; brighten up, and see what you are fit for. Better set up a puppet-show, and amuse the children than have the scales and odor of your professional rust covering you. A miserably dried up old maid is better than a sharp-angled, grunting, seedy, shriveled, musty old doctor, especially when all this is brought on by a monotonous tramp, tramp, tramp, in a gloomy treadmill. Get out of that. Let the old maid marry and be happy, and let the doctor that is self-buried in an office tomb have a resurrection, and startle people by appearing among them as a healthy, happy, genial *man*.

The editor of the *Dental Office and Laboratory* thinks the amalgam manufactured by the publishers of that journal is out-ranked in the best qualities of an amalgam by Sullivan's copper cement, though "it turns very black." He also says the prices of amalgams are too high. His publishers' charge is three dollars an ounce, while he affirms, "It is known that any good amalgam can be manufactured [for?] from seventy-five to eighty-five cents per ounce."

This prepares us to anticipate in the next number of that journal an exposé of another secret for the fast accumulating wealth of that firm. They have been in the habit for many years of baking little pieces of clay with a pin or two in each and selling them to dentists at a much greater profit than they get for their amalgam, and we have seen harder pieces of clay, too, only their "color" was not so good.

To roughen a smooth broach.—The barbs on the broach we buy occupies as much space as the broach itself, so that it will not enter many of the delicate root canals. Take an untempered, smooth broach, or form one from fine piano wire, and draw a sharp separating file length ways of the broach and you will soon have little grooves the whole length of the broach which will assist to catch the pulp in the root canal. It is also good to hold cotton twisted around it.

Dr. Reese, of Brooklyn, has a method of inserting gold and amalgam fillings by first lining the cavities with oxyphosphate, and then, while the oxyphosphate is still soft, putting in the first layer of gold or amalgam or whatever material he may use. In this way he gets an anchorage of the gold or amalgam in the oxyphosphate.

KNOWLEDGE AND SKILL.

Knowledge and skill cannot be divorced without detriment to both. Yet this is just what is done, to a great degree, in our popular system of education. We store the memory, and leave the other faculties comparatively uncultivated ; we cram the head, and leave the hands unskilled ; we over-burden the nervous system, and neglect to give strength, dexterity, and brawn to the whole man.

The mere acquisition of knowledge is not education. It will make walking syclopædias, but not wise men ; it will make theorists, but not practical workers ; it will raise us on stilts, but does not give common sense.

A better day is dawning. Already there are schools in Europe and in this country where knowledge and the application of knowledge are united. Knowledge is not only stored in the memory, but by its digestion and thorough appropriation it is made to enrich, develop, and strengthen all the faculties. The scholar is not only taught facts, but taught the application of these facts. Not only are the laws of mechanics made plain, but the fingers and muscles are skilled to demonstrate them. The young man and the young woman are sent out into the world of action and responsibility fitted for their spheres. They do not come from school impracticable theorists to be thrust aside by "self-educated" boys and girls that have been from childhood kicked about from pillar to post. They take their places in society strong in mind and body and spirit, not with swelled heads and puny, sickly bodies, to be a care on society, or at best to fill places that had better never have been made.

All hail to the technical schools of modern civilization !

"*Fixt.*"—In its last throws of expiring breath, the *Dental Practitioner* sends back a grim laugh at the ITEMS for using "*fixt*" as an English word. If the *Practitioner* had lived till the publication of Worcester's celebrated dictionary, then, instead of a derisive laugh, there would have been a sigh that it had not lived in *our* day. Worcester is authority not only for *fixt*, but *dipt*, *dropt*, *dript*, *mixt*, *rapt*, *snapt*, *strapt*, *stript*, *tript*, *vext*, and many other like terminations.

To Match Old People's Teeth.—To match the incisors of elderly people when the teeth are dead or dull, the plan commonly adopted was to rub the surface of the artificial tooth with sand-paper, but an easier way is to wipe over its surface with a little fluoric acid ; this took off the gloss and left exactly the smooth dull surface required. Owing to its property of dissolving glass the acid must be kept in a gutta-percha bottle.

The Dental Section of the International Medical Congress was to have received quite a thrust at the late annual meeting of the First District Dental Society of N. Y.; or at least we think the impression that this was to be was generally prevalent among the wise ones. Those mysterious committees of 10 from Chicago, New Jersey, and the First District Society itself were with others to have a kind of a side show during this meeting, that would place on foot a movement calculated to put in the shade the Dental Section and its promoters, and bring to the front entirely new men and measures. But we understand that even in this gigantic compound committee friends of the Dental Section were in a majority, and that so completely was the tables turned on those whose course seemed to antagonize the success of the Dental Section that in and out of that committee Dr. Taft and his coagitators were carried so completely to the front that these new comers were obliged to take back seats. Thus ends opposition to this great international meeting in Washington next fall. We are glad to be able to record that most of the leading spirits that have heretofore stood aloof now promise hearty cooperation.

Brethren, you need not be jealous for the success of a future International Dental Congress. As we have before said, let us make the Dental Section in the International Medical Congress a grand success, and *then* agitate the International Dental Congress. When and where and by whom led are questions of moment. When the time comes for action, let us see magnanimity and unselfishness. At the meeting of the Dental Section in Washington will be a fine opportunity for consultation, for then we shall have with us some of the most intelligent men of the profession from all over the world; and we shall then probably see that some who are ambitious to appear as "head and shoulders above their brethren" will be "small of stature" compared with some modest boys who are now comparatively out of sight, and America will not appear as the only land of the civilized world.

Familiarity with our patients is generally undignified, often mischievous, and sometimes disgraceful. Even with our friends, when professional labor begins, let familiarity end. A dignified reserve will be respected by the patient and will prevent a familiarity which breeds contempt. Many a dentist invites scandal by thoughtless liberties under the guise of friendship, which would be avoided by minding his own business as a professional attendant. Even if a patient does not resist such familiarity,—still worse if it is courted,—both are likely to suffer in their own sense of self-respect, though on the part of each it may be from mere thoughtlessness, and it is liable to end in folly, and possibly to embarrassment to business and social standing. The only proper, manly, safe relation with our patients is a dignified reserve.

Early Eruption of Teeth.—From Churchville, N. Y., we have the following remarkable case of the eruption of a full set of teeth before the sixth week of age:

From its birth the child has caused anxiety and care ; sleeping, moaning and crying most of the time. The doctor came when the child was six weeks old, and said : “ Strip that child to the skin, and let me examine it thoroughly, and see if I can find any cause for its restlessness. I fear, however, the trouble is in its head.” After having looked him all over, he said : “ He is a sound baby, so far as I can see. Do you think he may have a sore mouth ? Let us look.” When lo, and behold ! the child had a full set of upper and under teeth—the whole twenty-eight—and fully developed. They looked like two sets of artificial teeth put together in your hand, handsome and perfect. There is a thin skin that is not cut through yet, but so transparent that every tooth is fully visible, and they are entire in length. The doctor said he would cut it, but I said, no; nature has done marvelously so far, let her finish her work. The skin looks like that on beef suet, only not so thick. These teeth were erupted much earlier than six weeks. When it was four weeks old, I said saying to his mama, “ Where does he get that prominent upper lip ? He looks just like persons do when they first put in false teeth.” She laughed, and said, “ Well, he does.” We all now incline to think they were there at birth.

The physiology of digestion.—It would seem that by this time, in the investigation of this subject, physiologists should be pretty well agreed ; yet in many things they do not agree, and in some things they are all in doubt. When, what, how shall we eat ? are still vexed questions. The physiology of digestion and assimilation,—how food is converted into blood, and blood into various and distinct tissues,—is still mysterious. The border line, and the difference between physiological and pathological condition and function are not easily stated.

The part played in this physiological process by the very first act, chewing, may not be entirely understood. Shall food be slowly and minutely divided, or swallowed comparatively whole ? Most of us think the former quite essential, yet savages, and many like savages, bolt down the most crude mouthfuls, and are still healthy. Is digestion facilitated by insalivation, or shall we accompany our food with copious draughts of various fluids ? Some contend that nearly all the wonderful effects of saliva must be affected before the food enters the stomach, so that if it is largely diluted with water or other fluid, and quickly passed from the lips to the stomach, the saliva cannot do its office work ; yet the majority drink freely while eating, and live

through it. Is digestion and assimilation favored by eating frequently, or at longer intervals?—regularly, or only when hungry?—what we crave, or what reason dictates?—sparingly, or at the full of our desires? Is our digestive apparatus designed for vegetables and fruits only, or for meats also?—for eating a full meal just before sleeping, as all other animals do, or for sleeping on a comparatively empty stomach? Can our stomachs take care of our food unassisted, or must we add fermented and alcoholic stimulants? How about their opposites, the narcotics of tea, coffee, tobacco, and opium? Do these have a beneficial effect on digestion? What are the natural, normal, physiological wants of digestion, and what the artificial, abnormal, and pathological cravings?

Died of an overcoat; though the doctor says of pneumonia. Henry B. Stanton, one of the editors of the N. Y. Sun, and for a generation known as an orator, statesman and journalist died, Jan. 12, of the overcoat disease. The story is short and suggestive. The office was quite warm, “but I guess, as I am to remain but a few minutes I will keep my overcoat on.” The few minutes were extended to many minutes; and in the perspiration thus induced, Mr. Stanton went out in the cold wind. Of course it chilled him; that is, it suddenly closed the pores of the skin. Congestion—pneumonia—death followed. If women were not tougher than men they would die of a cloak or a wrap. (I have heard that they do, and then lay it to Providence). How inconsistent, and how defiant to the laws of nature, to come into a warm office or neighbor’s house, or lecture hall, or church, and sit in the same extra clothing worn in the rough, cold, outdoor weather? If we sprinkled our underclothing all over with water, and then ventured out into the cold outside atmosphere, we should be thought crazy; how much more sane are we to expose ourselves suddenly to the wintry blast, with the same amount of water from the pores of our skin saturating our clothes?

Implantation.—Dr. Younger, of San Francisco, implanted a right upper central incisor last October for an employe of the S. S. White Dental Manufacturing Company, in New York. The tooth had been out of the mouth for about a year and a half, and the one that was inserted had been recently extracted at the Cooper Institute. He removed the gum, and then with a bur cut into the alveolus till the root fitted properly. The patient tells us that the tooth has felt comfortable ever since. We saw it January 22d, and it still looked well and was as solid as any other of his teeth.

Metal for Models.—A good one is 80 parts lead and 20 parts antimony.

STATE SOCIETY MEETINGS.

- Michigan—Ann Arbor, Tuesday, March 29.
Northern Ohio—Cleveland, Tuesday, May 10.
Mad River Valley—Dayton, Tuesday, May 17.
Illinois—Jacksonville, Tuesday, May 10.
Kentucky—Louisville, Tuesday, June 7.
Indiana—Lake Maxinkuckee, Tuesday, June 28.

The annual meeting of the First District Dental Society of N. Y. was a grand success, in numbers, enthusiasm, and profitable deliberation. The clinics at the rooms of the N. Y. Dental College were seriously embarrassed by the great crowds. The circles around the operators were so small it was difficult for the worker to work or for the seers to see. However, some fine work was done and some ingenious mechanisms were displayed, and much satisfaction was expressed at the general success of the exhibit.

There were two lady dentists present—Miss O. Neymann of New York, and Miss S. E. Feltwell of Pittsburg, who displayed much good judgment in their operations. Of course they were the centers of attraction wherever in the different rooms they appeared as operators. They were certainly fine young ladies, skilled workers, and intelligent demonstrators.

Beecher's Dental Directory of Ohio is at hand. Friend Beecher seems determined to keep up with "the growing profession," and be able to tell us where the individuals composing it live.

Western Dental Journal is a journal just born in Kansas City, Dr. J. D. Patterson, Kansas City, editor. Price \$2.00. This must be a spunky city, or at least it must have some spunky men in it. It is bound to have a dental journal, if it can't retain what it has had. The one before us is bright, crisp and instructive.

Scientific American.—Every week this valuable periodical presents whatever is new in the world of science, art, and manufactures. Full of practical information, it discloses to the thoughtful not only what has been ascertained, but also suggests the possibilities still to be revealed. For forty years Munn & Co. have conducted this paper in connection with the procuring of patents for new inventions. The *Scientific American* is authority on all scientific and mechanical subjects, and should be in every household.

The Dental Review is a new journal, making its appearance in Chicago. Its first numbers are promises of intelligence, thoroughness and usefulness. W. T. Keener, 96 Washington Street, Chicago. Price \$2.50.

Miscellaneous.

LIFE IN THE FORMATION OF THE EARTH.

When we look at the surface of the earth, the vast strata of rocks and soil, we are not at first apt to consider the important part that life, in various phases, has taken in the formation of the visible part of the world as it now stands. To the earth life is indebted for its existence, and to life much of the earth's present form is due. They are and have been interdependent.

As rain falls it strikes sometimes on clay and sometimes on decaying vegetable substance; but in either case it eventually sinks deep into the earth, and finally finds its way back to the sea. When it strikes the earth, it has a slight dissolving power, but, as it sinks, becomes compressed and charged with gases. Even the most insoluble substances can be taken up. Few elements are then free from its power. Charged with the various gases, it dissolves carbonate of lime, to be used in building marine shells, salt for the sea, and substances necessary to the existence of marine plants. Sea weeds, having no roots, must take elements necessary to their existence directly from the surrounding water. Bromine, iodine, potassium, gold, and silver must all be ready for them when needed, and it is to carbonic acid gas that they thus owe their existence. In the same way, corals and other calcareous structures are directly dependent on this property of charged waters.

The water, passing through limestone rock, dissolves away the carbonate of lime, carries it to the coral polyp in the tropical waters, where it is appropriated by the animal, and left when the creature dies to be worn away by the waves and partly redissolved. What remains is piled up on the shore, where it afterward forms into hard coral rock. This is the cycle of the carbonic acid gas, and this the key to the formation of our coral reef, of our limestone and marble. In a similar way chalk has been formed. Various causes may unite to decompose these lime rocks, and the gas thus set free will aid in another cycle.

Life depends on the sun for existence, and all life is either directly or indirectly made of energy from the sun. Some of this energy may have come to-day, some ages ago; but, whenever it came, it is solar energy. The beef we eat, and the water we drink, simply give up latent heat taken from the sun; and this heat is what works our vital system and supplies us with energy. In other words, we are simply using up stored sunlight. In a given body, a plant, for instance, at the time of its death there is unused heat, which, if the plant decays, is partly used up in decay. If the plant only partially decays, we have some sunlight or heat stored for future use. This is so with our coal. In ages past, millions of years perhaps, the solar heat poured down from a cloudless sky on vast and magnificent forests of trees, which lived and died just as our trees do to-day; but, because they fell in damp places, they only partially gave up their solar heat. Then they became buried, and finally transformed into hard mineral. Thus by some wise provision of nature we have immense areas of coal, time-stored sunlight, ready for use; and now man is using these masses of

coal and making them give up to him the sunlight which they have so carefully stored through their vast ages.

There are other ways in which vegetable substance has been accumulating so as to form parts of the earth's surface. At the end of the glacial period, over the northeastern portion of this country there were vast numbers of small, shallow lakes left, dotting the country here and there. When the frozen mass of snow and ice gradually receded, these were filled with clear, cold water; but the water and the earth about were utterly devoid of life. Soon the southern breezes brought spores and seeds of plants; then animals came. The water began to fill with life and sediment to be formed on the bottom; then the moss sphagnum took root on the banks of these lakes, and, according to its habit, began to grow out on the surface of the water, dropping sediment as it went; and year after year, growing further and filling in more and more, till centuries having passed, the lakes became transformed into swamps of peat. This was the way our swamps were formed, and we have them even now in this same process of formation. In Ireland the far famed peat beds are examples. Here, in America, where coal is abundant, we have no need of peat, but when our supplies of coal are decreased, we have yet large tracts of peat to depend on. In New England alone there are 2,000,000 acres of peat swamp.

In Kentucky there is a curious bed of carbonaceous shale, which, before the discovery of oil wells, was used for an oil supply. This use is now abandoned, but we may yet have to resort to it again. This shale was once a great sargassum sea in the midst of the geological ocean that covered our continent. Just such a bed is being formed in the Atlantic Ocean, by the accumulation of vast beds of sea weed beneath the sargassum sea, in the center of the eddy formed by the ocean currents.

The peat beds are formed by the dropping down of decaying matter from the surface, but our salt marshes are formed in just the reverse manner. In these the plants grow from the bottom, while the peat beds are mainly formed by deposition from the surface. Through some cause, by winds or eddies, a sand bank is formed in some sheltered bay or creek. As time passes, this grows shallower and the surface becomes rich with decayed matter of both animal and vegetable origin. Soon it is uncovered at low tide, and then we see something green growing on the highest part. This is eel grass. Each year the grass decays till a sod is formed, which spreads as the bank becomes elevated, till the top is entirely covered with a layer of rich vegetable substance in a state of decay. Then the salt grass or marsh grass begins to grow, and soon only the highest tides flow on what a few centuries back, was a bank of sand entirely covered with water. This formation, in every stage, may be seen on our sea coast. Vast areas of this kind of land extend along our entire Atlantic coast, and much of it might be reclaimed at very little expense, as has been done in England to large tracts of salt marsh.

These are a few of the strata in the earth which are due mainly to life for their present position. There are many others of minor importance, but these few mentioned, best illustrate the principle of mutual dependence. When we think of it, we are surprised at the importance of life to the globe. Without its influence what a barren mass of rocks and soil we should have to live on!

BEAUTIFUL CRYSTAL ORNAMENTS.

Requirements—Various boxes containing the following powdered chemicals: Ferri sulphas, cupri sulphas, alum sulphas, potassii bicromas, potassii nitras, and common salt.

Directions—Dissolve any one of the powders contained in the box in some hot water so as to form a strong solution; pour the solution into an open tumbler. In the solution now suspend a piece of coke, a clinker, or any ornament with a rough surface; allow it to remain suspended a few days, and as the liquid evaporates, beautiful crystals will form and continue to grow on it. The color and appearance of the crystals will depend upon the salt used.

PASTE FOR BEESTING.

1. Tragacanth, 1 oz.; gum arabic, 4 oz.; water, 1 pint. Dissolve, strain, and add thymol, 14 grains; glycerine, 4 oz.; and water to make 2 pints. Shake or stir before using it.

2. Rye flour, 4 oz.; alum, $\frac{1}{2}$ oz.; water, 8 oz. Rub to a smooth paste, pour into a pint of boiling water, heat until thick, and finally add glycerine, 1 oz.; and oil of cloves, 30 drops.

3. Rye flour, 4 oz.; water, 1 pint. Mix, strain, add nitric acid, 1 drachm, heat until thickened, and finally add carbolic acid, 10 minims; oil of cloves 10 minims, and glycerine, 1 oz.

4. Dextrine, 8 parts; water, 10 parts; acetic acid, 2 parts. Mix to a smooth paste, and add alcohol, 2 parts. This is suitable for bottles of wood, but not for tin, for which the first three are likewise adapted.

A paste very similar to 3, but omitting nitric acid and glycerine, is also recommended by Dr. H. T. Cummings.—*L. Elie, Am. Journ.*

In Lockjaw, says an exchange, take a small quantity of turpentine, warm it and pour it on the wound, no matter where the wound is, and relief will follow in less than a minute. Nothing better can be applied to a severe cut or bruise than cold turpentine; it will give certain relief almost instantly. Turpentine is almost a certain remedy for croup. Saturate a piece of flannel with it and put it on the chest, and in a severe case three or four drops on a lump of sugar may be taken inwardly. Every family should have a bottle on hand.

The particular office of flies appears to be the consumption of those dead minute animals whose decaying myriads would otherwise poison the air. It was a remark of Linnæus that three flies would consume a dead horse sooner than a lion could. He, of course, included the families of the three flies. A single fly, *The Naturalist* tells us, will sometimes produce 20,000 larvæ, each of which, in a few days, may be the parent of another 20,000, and thus the descendants of these flies would soon devour an animal much larger than a horse.—*Sci. Am.*

White Incrustation on Brick Work.—The incrustation is sulphate of magnesia. Sometimes a cure may be effected by applying with a sponge, a solution of common muriatic acid, $\frac{1}{2}$ pound in a pail of water; but, if this fail, nothing can be done excepting to brush it off from time to time as it appears. It will eventually exhaust itself. A good coat of paint is good.